WESTERN GAS

March
1926

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A MONTHLY JOURNAL DEVOTED TO THE
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An Unusual Service Problem

Both high and low pressure gas distribution through 554 Miles of pipe to only 19,200 consumers scattered over an extended area of approximately 67 square miles—such is the unusual service problem solved by the St. Louis County Gas Company with Ingersoll-Rand Gas Compressors.

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Request Bulletin No. 3226

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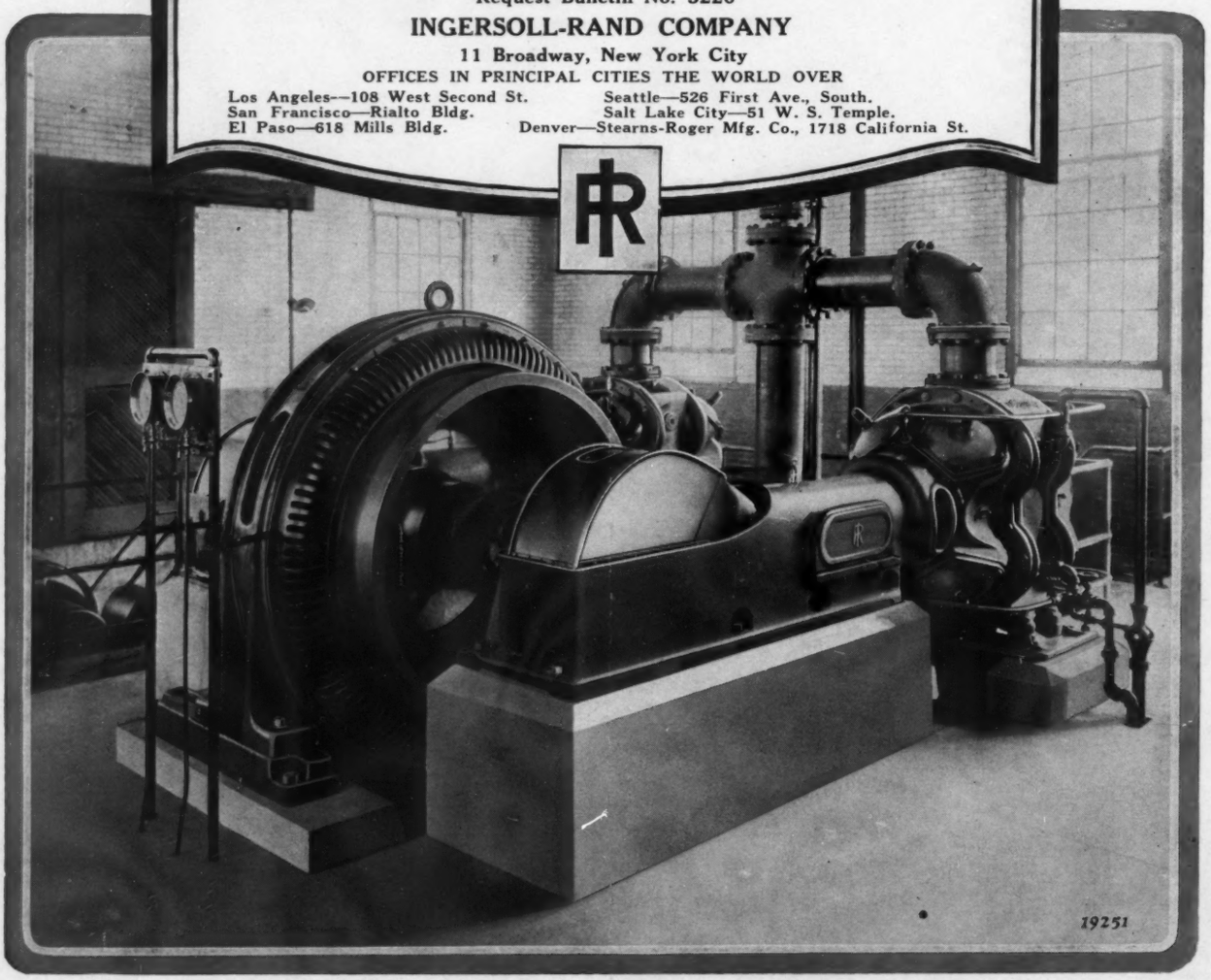

Ingersoll-Rand

STAR, WASHINGTON, D. C., THURSDAY, DECEMBER 17 1925

INSURANCE RATE CUT OFFERED IF WATER PRESSURE IS RAISED

Underwriters Propose 5 Per Cent Reduction as Inducement to Installation of New System Long Sought for City.

As an inducement for installation of a high-pressure water system in the National Capital, the Board of Fire Underwriters here, which represents all the fire insurance companies in the country, has decided to reduce the premium rates on downtown property 5 per cent if the system is installed.

This offer, which has just been decided upon by the Board of Fire Underwriters, will cover all property within the area proposed for a high-pressure water system—namely, from K street to the Mall and from North Capitol street to Nineteenth street, and will affect about $250,000,000 worth of private insurable property. If the high-pressure water system is not placed in downtown Washington, however, the National Board of Fire Underwriters, which has already made preliminary steps for its survey of conditions here, will not only be unable to reduce the rates, but, in the opinion of experts, will unquestionably have to raise them considerably.

Praise Proposal.

The offer to reduce the insurance rates here is considered by David Lee, chairman of the board of trade's insurance and fire protection committee which has advocated a high pressure system for 23 years, as a clear indication that the insurance companies of the country are concerned in the situation here. Mr. Lee and his committee feel that the offer is the most important development that has taken place since the high-pressure system has been advocated.

The committee regards this action as a plain inducement to the officials and business men of the National Capital to "remedy a serious and acute condition here."

Approximately $3,102,000 was paid in fire premiums in the District last year. Half of this amount was paid on property within the proposed high-pressure area. A reduction of 5 per cent would mean a saving of $75,000. If the system is not installed it will mean a raise in rates greater than the proposed reduction and the business men will not only loose $75,000 but probably will pay more than that in increased premiums. If the high-pressure system is installed, it is pointed out by the committee, the money saved soon would pay for the installation of the system and the lives, property and inconvenience [illegible] would at the same time be protected. In addition to this the Government would have a vastly greater protection for its buildings and irreplacable records which are not insured by private concerns.

The Board of Trade, which somewhat irked recently [illegible] covered that [illegible] be appropri[illegible] system [illegible] Bur[illegible] Mr[illegible]

"...the money saved would soon pay for the installation of the system"

LARGE cities throughout the country have learned that an independent high pressure system is a good investment.

Standard Bell and Spigot high pressure Cast Iron Pipe has distinct advantages over other materials. It is flexible, tight and free from corrosion. It is also safe from any danger of collapse where the empty main system is used.

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Official Publication Of The
Pacific Coast Gas Association

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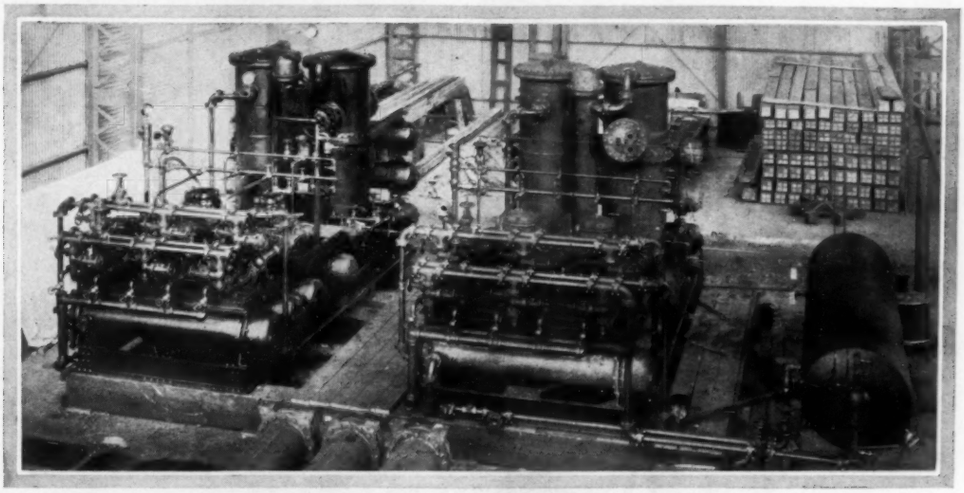
This Plant is really PORTABLE!



Two Braun Portable Absorption Plants set up in the erecting shop for complete hydrostatic test prior to shipment.

A SEVEN-TON truck, the regular field gang, and a few hours' time — the Braun Portable Absorption Plant is ready for operation on its new location. Every feature of design and construction conforms to one requirement...*portability.*

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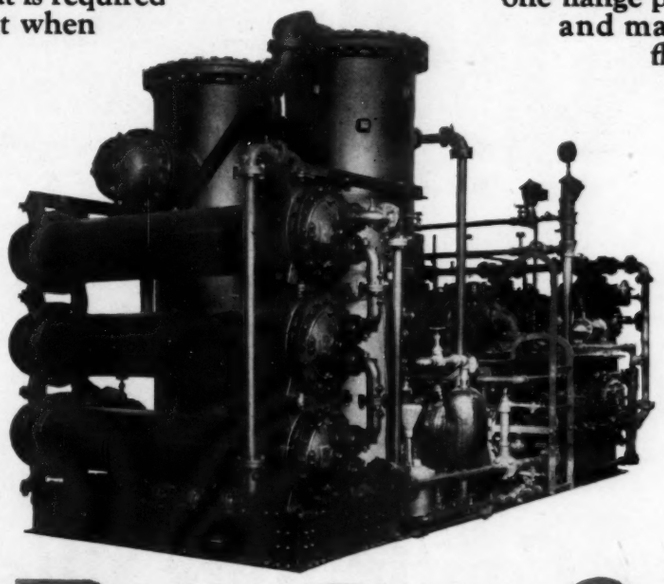
Quick Assembly Assembly of the two sections of the Braun Portable merely involves bolting together one flange plate on the frame, and making eight pipe flange connections.



The Braun Portable Absorption Plant is conservatively rated at 2000 gals. per 24 hrs. A knock-down cooling tower and basin are furnished with each plant.

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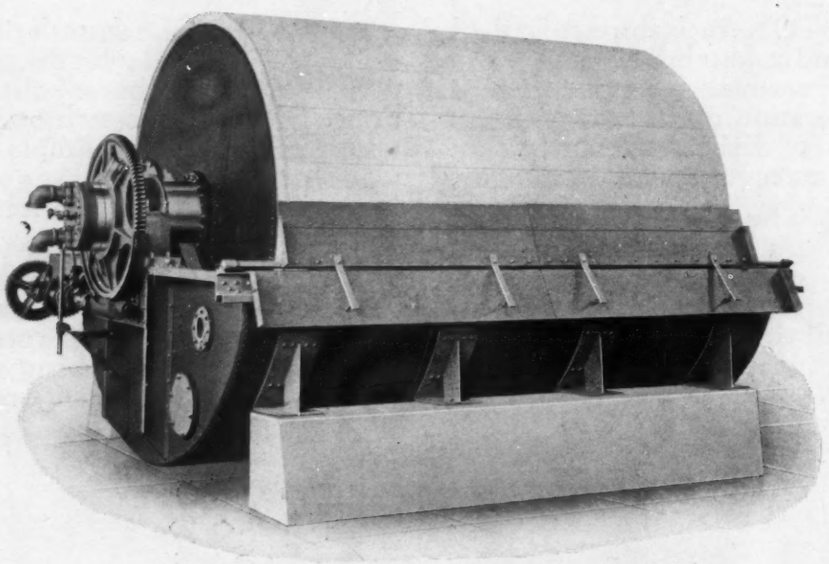

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These stops have extra heavy walls made of the best grey iron obtainable. The castings are free from sand holes. Core work, moulding and machining are just as accurate as in the case of brass body stops. Keys and washers are made of Mueller red brass. The keys are ground and polished in, and the grinding is superior because two metals of different density grind to a more perfect bearing surface.

Mueller Iron Body Stops are widely used by an increasing number of gas companies throughout the country because these stops can be installed without any question of their satisfactory service.

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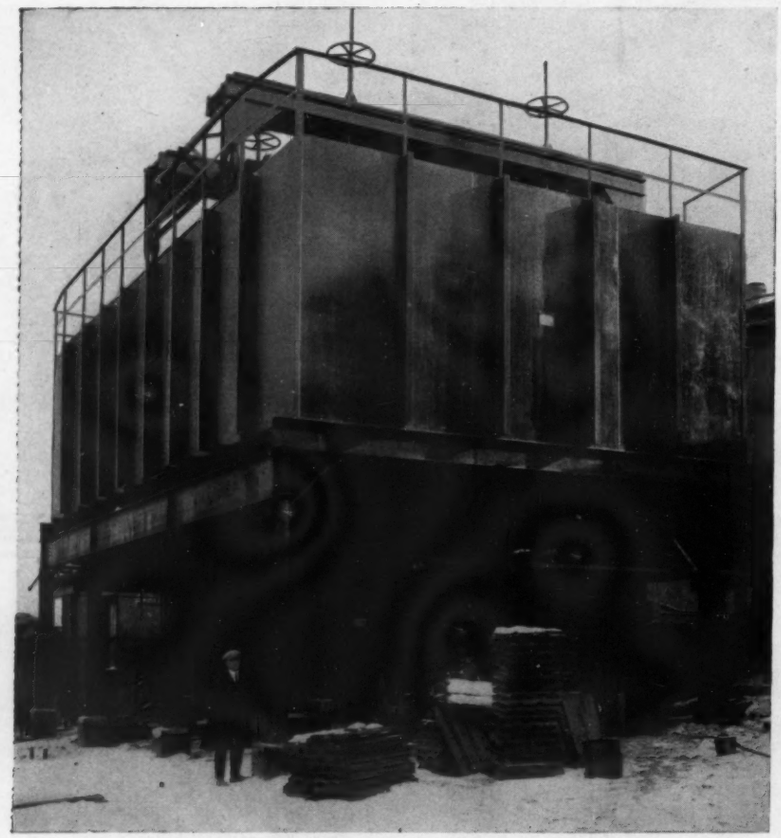

A Steere "all welded" two compartment, elevated, purifier box, equipped with Steere reversing valves, bottom dump doors and gantry crane

The entire equipment including the I beam substructure is fabricated by ***Steere arc welding methods.***

The steel is shipped direct from the steel mills to the place of installation. (It is not necessary to lay out and punch the plates in a shop).

The doors and fittings are made in our shops and shipped to the job.

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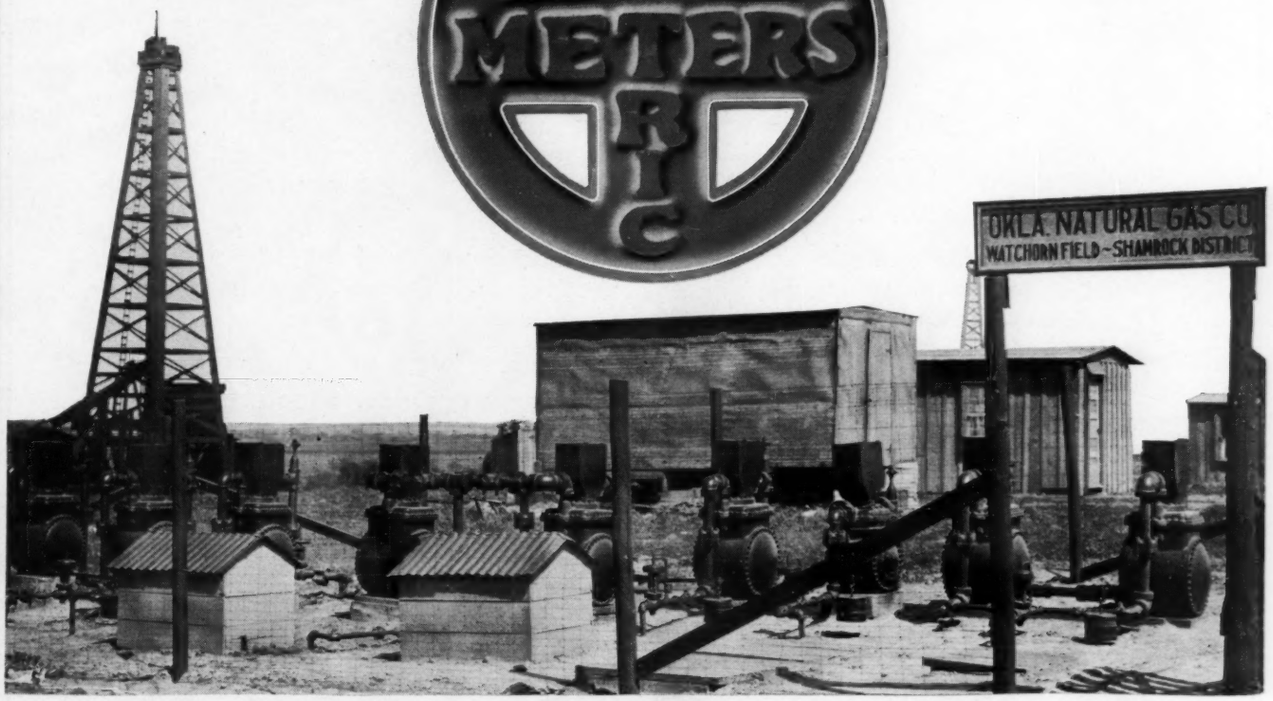
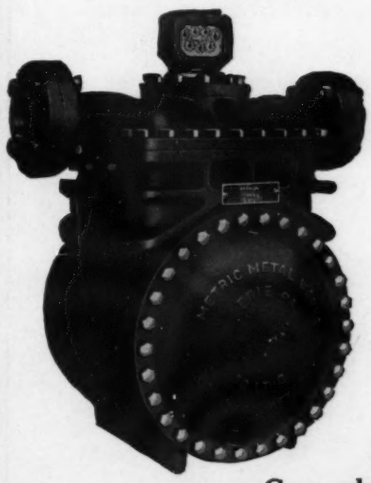


30-B
A special for gas measurement on drilling and pumping wells



Should your desire be to have a gas meter that registers the flow with not only uncanny accuracy but gives correct service for an extraordinary long time without attention or complicated adjustments, install a Metric Iron Case Drilling Meter on the next well you start, or place on the pump.

60-B
Same high pressure meter as shown on left fitted with Recording Gauge

These two Metric Iron Case Drilling Well meters are designated 30-B and 60-B. They and other types of Iron Case meters are fully described in Bulletin 118. We have your copy ready to mail.

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The Spotlight of Publicity

UP to a very few decades ago, Publicity was a thing shunned by business. Great corporations which, during the past fifty years, have revolutionized the commercial activities of man, avoided it as dangerous. As to public service companies, Publicity was something to keep away from. They would have none of it.

A concrete example of a great railroad builder's idea of Publicity and its relation to the consuming public is the following widely quoted phrase, which typifies the attitude of utility men of 1875 toward their patrons:

"The Public be Damned!"

This "sit tight" policy, thanks to the birth of Publicity, has been buried in the same graveyard as the Dodo, the Inquisition and the "Divine Right" principle.

Publicity today is the watchword of business. Commerce thrives on it. Cities grow over night with its help. Coral Gables would still be a barren waste but for the power of Publicity.

Public service corporations today are fine examples of the new policy of "Telling the Public." The consumer is well advised through the press and other well known media of the latest development of company activities. A new extension, the erection of a great gas holder and the laying of a line to strengthen the present gas supply make splendid reading for the consumer.

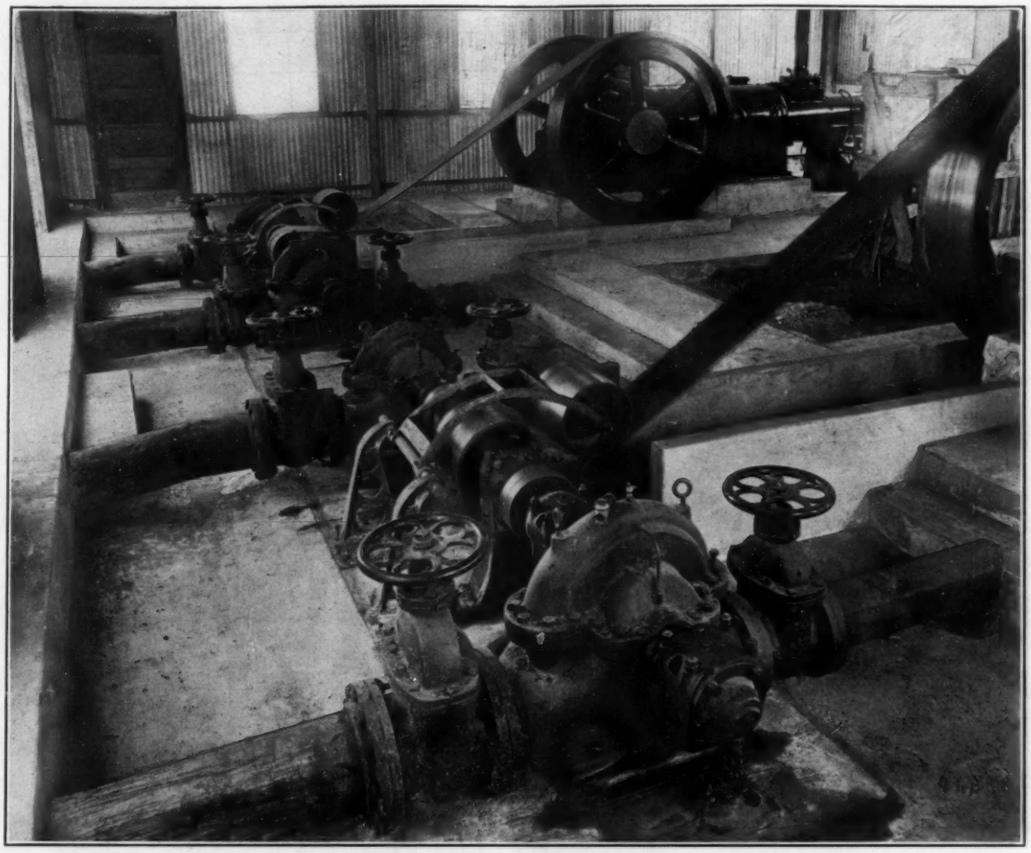
Newspapers welcome constructive stories about your business. After all has been said, city editors are not the tyrants they are pictured to be. You will find them hard working, clear headed, wide awake men. They appreciate good service and know the meaning of reciprocity.

Although the Gas Industry has been slow in making use of Publicity, it now sees the value of better public relations. Tell your customers the Story of Gas through the press, through speakers' bureaus and through the radio. Open your books to the public. Come out from behind closed doors. Play ball with the newspapers!

Fear not "The Spotlight of Publicity!"

Southern Counties Gas Company

Los Angeles, California



Auxiliary Room—Southern Counties Gas Co. Compressor Station—Ventura, Cal.

Many engineers spend a great deal of time and thought selecting machinery for the main power plant yet entirely overlook the importance of auxiliaries.

The above plant designed by A. F. Bridge, Executive Engineer for the Gas Company, consists of 3-60 H.P. Belted CLARKS each driving a set of GOULDS No. 8 Split Case Pumps; one side of the set handling the raw water over the cooling tower and the other the treated water thru the jackets and gas coolers. Normal capacity 3000 G.P.M. per unit.

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60 to 200 H. P.

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Hot water is especially severe on corrodible metals.

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Water heaters equipped with COPPER boilers and BRASS pipe deliver clean hot water and give lasting satisfactory service.

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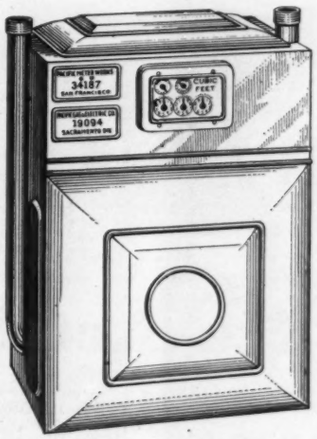

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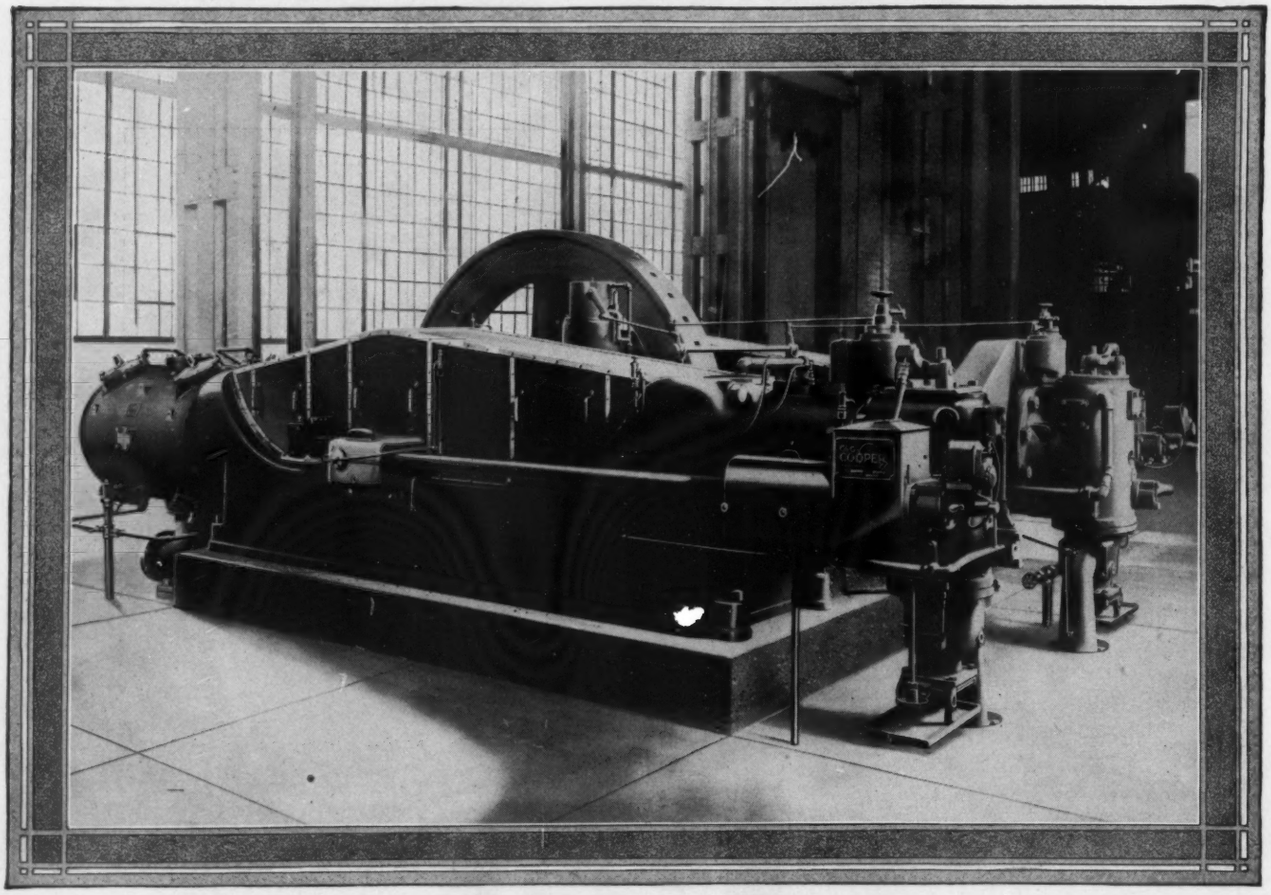

How Does He Act Under Fire

Whether it's a hunting dog, a running horse, a straight eight, or the man who sits across the desk from us, we are never quite certain about him until we see how he acts under fire. Can we really depend on him when the test comes?

It is the same with manufacturing organizations. They can all make beautiful promises, well painted machinery and confidence inspiring guarantees. But there always comes a testing time for all of them and it's the way they measure up after the last payment has been made that forever wins men's confidence.

The Sinclair Oil & Gas Company have completed another installation of two Cooper Type-80 gas engines, known as Plant No. 6, near Covington, Oklahoma.

Cooper gas engines are built in standard sizes from 80 to 1500 B.H.P. for every power purpose.

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COOPER

WESTERN GAS

A Monthly Journal of the Gas, Gas Appliance and Natural Gasoline Industries in the *Eleven Western States*

Building *a* Desirable Load *on the* Natural Gas Line *through the* Gas Engine

By F. M. BANKS

Sales Supervisor, Southern California Gas Company

The discussion of natural gas engine business in Southern California which is given in part in this article was presented to the sectional meeting of the Pacific Coast Gas Association, held at San Diego, February 18-19. Mr. Banks, the author, describes at length the features which make this class of load desirable to the utility, and gives significant data on comparative operating costs of gas engines and electric motors. His paper is based upon extensive and lengthy tests made upon Southern California Gas Company lines, and the information submitted should prove of great value wherever natural gas is available for this class of business. The gas engine load is growing, as seen in the 400,000 active horse power connected in Southern California from Bakersfield south.. Wide application has been made of the gas engine, covering the needs of oil and gas companies, agriculture, and many classes of industrial users.

INTERNAL combustion engines using natural gas for fuel were extensively employed first in the oil and gas fields of Southern California for pumping and operating compressors.. For this work both two and four cycle engines were used. It is a well known fact that two cycle engines do not operate with as great an economy of fuel as can be obtained with four cycle engines, due largely to the fact that the former do not scavenge as thoroughly as do the latter. However, because of the design, two cycle engines are less expensive in first cost than four cycle, and in the oil fields where conservation of gas was first considered non-essential many two cycle engines were used. Nevertheless, the ultimate necessity for economies even in the fields has resulted in the installation of an incrasing proportion of four cycle engines. Where gas must be purchased retail the desirability of operating with the greatest possible economy is more apparent, though really no more important. Under these circumstances four cycle almost entirely exclude two cycle engines.

In Southern California a relatively large portion of the water required for irrigation must be pumped. Furthermore, there are some areas in which the water level is quite low, often exceeding a depth of 200 feet below the surface. The prevalence of these conditions is responsible for the installation of a large number of gas engines for this work.

At the present time there are almost 400,000 active gas engine horse power connected in Southern California from Bakersfield south. In the last few years installations have been made at the rate of approximately 50,000 horse power per year. In 1925 the increase was nearer 75,000 horse power. A good portion of this horse power operates continuously in oil company and gas company work. The remainder, something like 25%, is used in agricultural and industrial work. A great diversity of applications has been made which covers the fields of prime mover requirements more completely than is generally known. Refrigeration in ice plants and creameries has developed into a worthwhile field for sales effort. Under certain circumstances generation of electricity is being carried on, while engines

F. M. Banks

are being used for driving machinery for various purposes. For those utilities supplying natural gas the engine business has proven desirable for a number of reasons. First, the load factor is relatively constant. The small variation seldom causes the factor to reach unity and then only under extreme conditions and for short periods. This is due to the fact that first cost dictates the installation of equipment approximating as nearly as practicable the required load size. Second, in a large percentage of cases the daily operating load factor is near unity. It is not difficult to discern the reason for the uniformly good daily factor. Gas engines are installed in the majority of cases for one or both of two reasons; first, necessity for uninterrupted service, and second, economy of operation. Plants requiring uninterrupted service are in the main blessed with good daily load factors. Furthermore, in most plants where gas engines have operated with continued good results the season of operation is fairly long. Necessarily, the realization of the economies to be effected by the use of gas engines is dependent in large measure upon a good

(*Continued on Page* 25)

Plant and office properties of the Panama-Colon Gas Co.

Selling *the* Advantages *of* Gas *to* Consumers *in the* Torrid Zone

By George H. Finley

SOME 3,200 miles from the southernmost limits of these United States lies a tiny area of land and water, no larger than most western counties, over which our Government holds treaty rights of perpetual occupation, use and control. The whole world pays tribute to the use which has been made of the Panama Canal Zone since its control was ceded to the United States in 1903, for history has few examples of man's handiwork that are as astounding or as far-reaching in importance as is the Panama Canal.

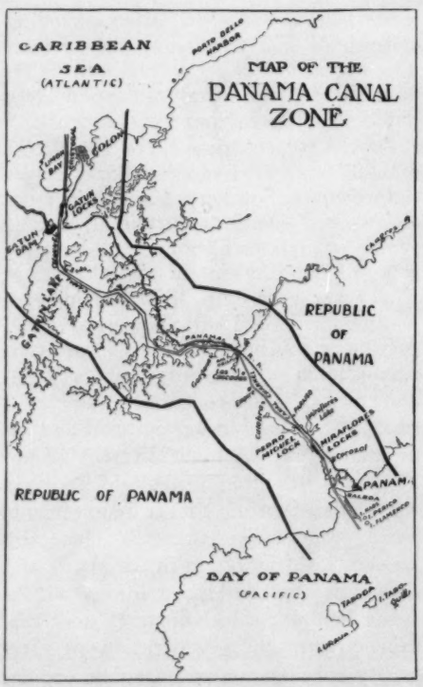
It has become an axiom that progress follows the American Flag, and nowhere is this more true than in the Canal Zone. Here, travelers say, is a bit of territory where government nears perfection, where healthfulness has been won in the face of pestilence, and where the conveniences of life are many.

Americans know the story of the Canal, and of the bringing of American efficiency to this bit of Panama; but some of the details are not common knowledge. For instance, how many western gas men know that since July 4, 1917 a gas utility has been operating in the 10-mile strip which runs from Panama on the Pacific to Colon on the Atlantic, and that gas service of strictly modern brand has been brought to almost every spot in the Zone where demand for it exists.

Point With Pride

It is the purpose of the present article to point a finger of pride at the Panama-Colon Gas Company, whose youthful career is full of achievement and whose future is bright with promise. Even as this is written the Company is recording another triumph for gas, as its Colon Division executes a contract to serve several Army and Navy posts on the Atlantic side, laying the first high pressure welded line on the Isthmus, to tie in the new consumers.

This far-southern gas system serves a field that is unique. In all the length and breadth of gasdom will be found none other like it. A land and water area of 553.8 square miles makes up the Canal Zone proper, which is a jungle-bordered strip 10 miles in width, severing the Isthmus and running a distance of 50 miles from Panama and Balboa on the Pacific side to Colon and Cristobal on the Atlantic. Harking back to a little grammar school geography it may be recalled that the coast line of Panama is a devious one—so much so that the Pacific side of the Zone is farther east than the Atlantic; thus, the gas men who have gone south from former locations on the northern Pacific Coast must accustom themselves to a strange reversal of Nature, when Old Sol at certain seasons rises from the waters of the Pacific and dips into the Atlantic for the night.



As to climate, latitude North nine is bound to imply some degree of heat, but local boosters claim with authority that Panama is far from intolerable by day, and comfortably cool at night.

Cities and People

Panama City and Colon, the two principal communities within the limits of the Zone, are not under the United States Government, but remain parts of the Republic of Panama. Both are largely made up of Panamanians and West Indians. Panama is a city of 59,458 and Colon of 31,320 (1921), while the civilian population of the Zone, made up principally of employees of the Canal and railroad, numbers 27,145 (1924). Of these 7,805 are Americans, skilled labor being almost altogether in the hands of American men. Panamanians and West Indians supply the bulk of the unskilled labor required to maintain the Canal and railroad.

At the Caribbean entrance to the Canal is Cristobal, formerly a part of Colon, but now an American community; at the Pacific terminus is Balboa, also an American town. The town of Ancon lies closely adjacent to Panama, on the east.

On either side of the Isthmus are located a number of military posts of which more will be said later. Incidentally, the Company flaunts the claim that it sells more gas to Army and Navy stations than any other gas utility, bar none.

Serving a Unique Field

This, then, is the field served by the Panama-Colon Gas Company. It is highly cosmopolitan, as the foregoing outline suggests, and many are the complications introduced into the operation of the Company due to this fact. A cross-section of the consumer population

would bear some resemblance to Joseph's coat for variety of colors—with Panamanians, West Indians, Chinese, and Americans chief of the elements in the ensemble. To meet this characteristic of its field the Company issues all of its advertising matter, publicity and bills in two languages, English and Spanish. The Panama Division sales force is made up of two Panamanians, one American, one Chinese and one West Indian.

Another circumstance which might have proved fatal to gas company promotion is the fact that the commodity, gas, was sold to a distrustful public, whose long-time use of solid fuels formed a sales resistance as difficult to vanquish as that which faced the original pioneers of gas service.

100% *for Gas*

The Company's present aim seems to be a hundred per cent gassification of its field, and that desired condition seems to be just over the horizon, judging from the current rate of progress. Mr. Vecker, vice-president and general manager of the Company, on a recent business trip to the States, mentioned a number of favorable auguries to the writer. A contract which had at that time just been arranged with the Government will result in additional business totalling 2,500,000 cubic feet a month, and involving the service of a number of military stations on the Atlantic side. These include Fort Randolph, a coast artillery garrison; Coco Solo, submarine base; France Field, naval aviation station, and Fort Davis, home of the 14th Infantry. Some of these points have already been brought into the gas system by this date. Fort De Lesseps, on the Atlantic side has been on the lines for some time, as well as posts located at the Pacific terminus. By the first of March it is thought that the extensions on the Atlantic side will be complete, and a high percentage of Uncle Sam's representatives in the Zone will be eating gas-cooked meals. New business secured with Army and Navy posts in the Colon District calls for the use of 250 domestic stoves, 92 sections of hotel stoves, and about 300 water heaters.

Construction Program

Further indication of increasing demand for the Company's services is seen in the construction program now being carried through, involving an expenditure of about $150,000 over a 10-month period ending in June, 1925. Purchases called for in this program include a one-million cubic foot generator for the Panama Division, boilers of 150 H. P. capacity, compressors, blowers, and other plant accessories, and seven miles of four-inch high pressure mains. Installation of the new gas outfit was expected to be complete by the end of March, while the laying of the line on the Atlantic side to serve Army and Navy posts is in the last stages of construction.

The Panama-Colon Gas Company is too young to have developed any hampering traditions, but it has had time to put into action a number of sound policies which should interest companies farther north.

PANAMA
We congratulate you on your
Twenty-Second Birthday
and express the wish for a continuance of the wise statesmanship and constructive development that has directed you thus far in your public affairs relations
"If it is done with heat you can do it better with gas"
PANAMA-COLON GAS COMPANY
"At Your Service"
PANAMA COLON GAS CO.
巴拿馬恤卿煤氣公
無倘莫熬君
任蒙如力如
歡賜煤是禹
Dia de las Animas
NOCHE MISTERIOSA
FANTASMAS -- BRUJAS -- ESPIRITUS
La palabra inglesa Gas es derivada de la palabra alemana Geist, que quiere decir fantasma.
Sin embargo, no hay misterio en el GAS, el combustible rápido, Rápido como los espiritus,
PERO NO TAN ILUSORIO.
TODO LO QUE ES NECESITÉ HACER CON CALOR LO PUEDE HACER MUCHO MEJOR CON GAS.
Siempre a las órdenes del Público,
MA-COLON GAS COMPANY
"HALLOWE'EN!!"
"THE NIGHT OF MYSTERY!"
SPOOKS — WITCHES — SPIRITS
The English Word GAS Is Derived From The German Word GEIST Meaning Ghost.
But There Is No Mystery About
"GAS THE SPEED FUEL!"
"Swift As A Spirit!
But Not So Elusive!"
"If it is done with heat you can do it better with gas"
PANAMA-COLON GAS COMPANY
"At Your Service"

Seizing the opportunity for sound ad-copy tie-ups is the thing the Panama-Colon Gas Company does best. We can't vouch for the aptness of the Chinese copy above, but the advertisement in Spanish, just below the Oriental one, is surely in good taste—the same copy, in English, appears below it. All of these advertisements ran in publications in the Canal Zone.

Co-operating With Retailers

In the first place, the Company exists to sell gas, and every move made is directed to this end. A strong appliance merchandising department is maintained, the Company selling in direct competition with appliance dealers, but at the same time co-operating with the retailers to an unusual extent. The retailers are given samples for display, which they advertise. Upon receiving an order they turn it over to the Company, the Company promptly delivers the appliance and takes over the account, returning 15 per cent commission to the dealer. Thus the latter makes his profit without involving his own money in the transaction, and with the gas company providing storage space instead of the dealer a further incentive to push gas appliance sales is provided.

Appliances are sold on terms as in the States, a year being allowed for payment, on a basis of 10 per cent down and 10 per cent monthly.

Consistent sales effort is made by the appliance sales branch of the Company, and the field is being intensively worked. Ninety per cent of the appliance sales are made through this channel. Company sales rose to a high water mark during a seven-month period beginning in February, 1925, during which 1500 cooking stoves and 800 water heaters were disposed of to employees in the Canal Zone.

Aiding Dealers Is Good Business

The liberality shown in dealer helps is justified on several adequate grounds: It makes it possible to place a high class of appliance in service, with all the evident attendant advantages; it assures dealer and consumer good will; it produces sales effort on the part of the retailer, since his money is freed for use in other lines if he handles gas appliances; it gives gas a strangle-hold on other appliances, as seen in the fact that practically no oil stoves are handled by dealers in the territory served by the Company. Results are the acid test of any policy, and mounting appliance sales are resulting from the promotion plan used in Panama.

(*Continued on Page* 32)

James L. Stone

Serving Spokane Consumers *with* 450 B.t.u. Standard Gas

By James L. Stone

General Manager, Spokane Gas and Fuel Company

AUTHORIZATION to sell 450 B.t.u. gas to its consumers was granted the Spokane Gas and Fuel Company by the Washington Department of Public Utilities, several months ago, the order being effective October 1, 1925. In the present article James L. Stone, general manager for the Spokane Gas and Fuel Company, presents the experience of his company with the lowered calorific standard since its adoption. He prefaces his remarks with a review of the necessity and desirability of adopting the 450 B. t. u. standard.

THE need and desirability for adopting a 450 B.t.u. standard for gas sold by the Spokane Gas and Fuel Company is clearly defined in the report of the chief engineer of the Washington Department of Public Utilities, Wellington Rupp, submitted after investigation of our company's proposed change in heating value of gas. The principal points educed in his report are as follows:

1. That there would be no material increase in consumption due to the reduction in B.t.u.

2. That our present combined coal gas and carburetted blue gas equipment could be utilized without additional capital outlay for the new gas.

3. That it would increase our generating capacity.

4. That we could use up our large surplus of coke—the market not readily absorbing the coke output on account of its high ash content.

5. That under the new standard we could give improved service, due (a) to less variation in specific gravity; (b) to decreased condensation in service pipe; (c) less servicing of customers' appliances; (d) less blackening of utensils.

6. That it would reduce our manufacturing costs.

He sums up his report as follows:

"It is therefore reasonable to assume that the reduction to 450 B.t.u. in the heating value standard required for gas manufactured by the Spokane Gas and Fuel Company would enable the utility to manufacture its gas more cheaply and efficiently; would not cause any appreciable increase in the consumption of gas per customer; and would enable the utility to improve its service to the customer."

We started the B.t.u. reduction by dropping from 530 to 520 September 24th, 1925, and continued as follows:

October 4th, dropped to 497.
October 20th, dropped to 490.
October 31st, dropped to 475.
November 10th, dropped to 460.
November 20th, dropped to 450.

Since November 20th the B.t.u. content has been kept between 450 and 460.

When we started the reduction in B.t.u.'s we sent men out at once to make the proper adjustments on the appliances of our industrial customers. This was followed up by an adjustment of appliances in apartment houses. Our experiences had shown us that apartment house appliances needed adjustment more than appliances of our residence customers. This has been completed and now we are adjusting appliances of our residence customers. Of course, all along we have promptly taken care of all complaints that came from any of the customers.

The reduction in B.t.u. was so gradual and service complaints were taken care of so promptly that our customers did not notice the change. The reduction in specific gravity, as well as the specific gravity being kept constant, was, of course, an important factor in keeping complaints down.

No Increase in Complaints

From the attached sheet showing the "Analysis of Orders For the Improvement of Customers' Service" you will note a very satisfactory condition. The complaints have been no higher than they were before the B.t.u. of the gas was lowered. In fact, December showed a marked falling off in complaints. After we have completed our routine

(*Continued on Page* 42)

ANALYSIS OF ORDERS FOR IMPROVEMENT OF CUSTOMERS SERVICE

	Adjust Appliances	*Improve Pressure*	*Adjust Pilot*	*Adjust Governor*	*High Bills*	*Test Regulator*	*Low Bills*	*Total*
1924—								
January	145	117	20	1	24	1	..	308
February	135	29	19	..	21	1	..	205
March	105	22	4	1	29	2	1	163
April	165	33	7	1	46	1	..	253
May	243	70	6	2	48	2	..	371
June	284	84	14	2	71	..	1	456
July	374	180	16	..	101	4	9	686
August	258	157	19	..	45	4	1	484
September	277	158	17	..	45	1	..	498
October	304	131	16	..	28	..	..	479
November	227	57	8	..	46	1	..	339
December	189	206	10	..	45	4	..	454
	2706	1244	156	7	549	22	12	4696
1925—								
January	217	52	10	1	47	4	..	331
February	170	39	17	1	48	3	1	279
March	161	23	13	..	31	3	..	231
April	197	29	8	..	39	3	..	276
May	176	25	10	..	39	10	..	260
June	156	59	4	1	23	2	..	245
July	198	92	6	1	46	9	..	352
August	214	302	21	1	47	5	..	590
September	189	185	10	..	22	..	..	406
October	156	192	13	3	2	16	..	382
November	350	231	6	..	3	5	..	595
December	238	89	6	..	3	6	..	342
	2422	1318	124	8	350	66	1	4289

California Utilities *and* Public Benefit *from* Automatic Rate

By Carl E. Crenshaw, *Assistant Engineer*
Railroad Commission of the State of California

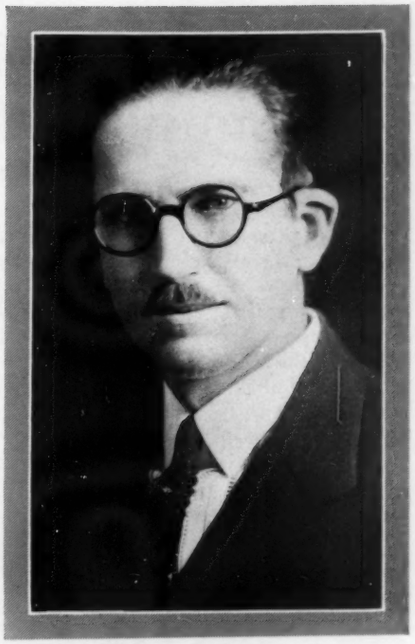
THE automatic gas rate in California had its inception in 1918, in the fixing of a wholesale rate to the City of Palo Alto, at which time it was more or less of an experimental nature.

The application and results obtained through the operation of this type of rate proved to be so satisfactory that in 1921 it was urged before the Commission by representatives of the consumers that this form of rate should be placed in effect for all utilities supplying manufactured gas. The Commission adopted this suggestion and at the present time practically all the utilities supplying manufactured gas have this automatic feature.

This form of rate has also been adopted by utilities supplying surplus natural gas for industrial use in competition with fuel oil and very satisfactory results have been obtained.

Oil Costs Determine Changes

In developing the automatic gas rate the Commission made very exhaustive studies into the efficiency and operation of the gas plants of the utilities supplying artificial gas in California. As a result of these studies it was determined that the cost of oil is a large part of the cost of manufacturing gas, representing approximately 40 to 50 per cent of the total cost. Due to this fact it seemed logical that a differential cost could be determined based upon the price of oil which, applied to the gas rates, would result in the gas rates fluctuating with the price of oil.



Carl E. Crenshaw

This differential cost was determined by first establishing the rates of a utility based upon a fixed cost of oil; then the efficiency of the plant supplying the gas was obtained, based upon the cubic feet of gas produced per barrel of oil, which was then applied to a 10 cent variation in the price paid for oil in order to get a corresponding differential cost to be applied to the gas rates.

The automatic feature is introduced into the rate by inserting a clause to the effect that the gas rates would be increased or decreased by from two to three cents per thousand cubic feet, depending upon the efficiency of the company's plant supplying same, for each 10 cents increase or decrease in the price of oil.

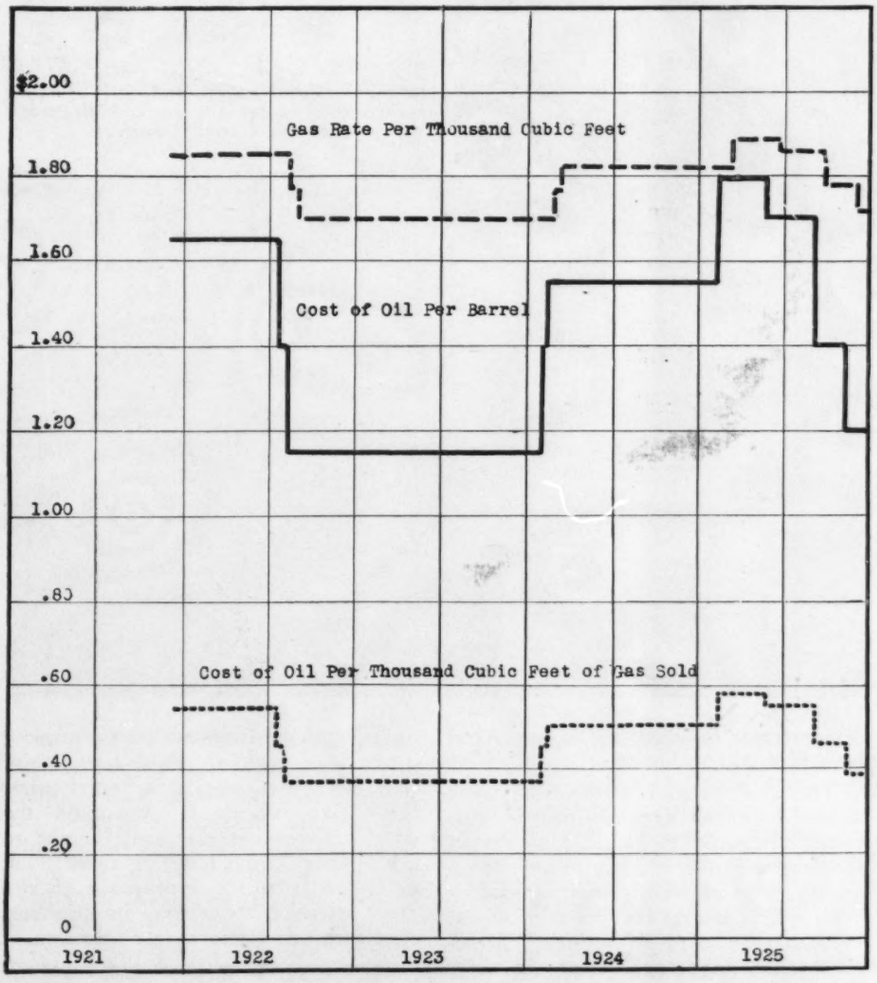
The utilities are required by order to file with the Commission an affidavit each time there is a change in the price of oil, setting forth the price paid for oil and the effective date of the change.

15 Utilities Use Rate

At the present time there are some 15 utilities supplying artificial gas in California and using the automatic gas rates. These utilities supply some 18,000,000,000 cu. ft. of gas per year to consumers; therefore, each one cent increase or decrease in the gas rates would amount to approximately $180,000 per year.

There have been 12 changes in the price of oil from 1921 to date, ranging from 10 to 50 cents per barrel and the majority of these changes were 25 cents

(*Continued on Page* 43)



This chart was compiled from a typical company operating under the automatic rate. It shows the effect of the price of oil on the cost of operation and the manner in which the automatic rate adjusts these changes.

Give *the* Salesman *a* Chance *to* Tell His Story! Simplify *the* Appliance Display Room

By H. Elliott Taylor

I SAW a salesman working against almost overwhelming odds this morning. He was an industrious enough young fellow, frankly interested in his customer's welfare, apparently sold on his merchandise, and quite naturally trying to close a sale that would mean a good profit to his company.

He was working on the floor of the stove and home furnishing department of a big furniture store; a store incidentally that has acquired an enviable reputation in its home city.

There was no lack of merchandise about upon which he could construct an interesting and convincing sales talk. And the very fact that the customer had come into the stove department was proof positive that half the battle had been won in some other arena—probably the advertising columns of the daily paper, possibly on the word of a friend, or perhaps through the medium of the display in the window. At any rate the thoroughly necessary attention and interest had been aroused. There remained for the man on the floor the task of stimulating the resolve to act.

Sale Fails to "Close"

Yet, with all of these elements battling valiantly in his favor he was unable to come through with anything more tangible than the customary "Well, I'll think it over and I may drop in again."

And as the customer walked out of the store I could not but recall the pertinent comment that I had once heard expressed by a salesmanager in another industry, "Close 'em or lose 'em". Good prospects may come back. No doubt a gratifying percentage of them do. But that is a tribute more to the inefficiency of selling methods in competitors' stores, than to the stellar performance of the first demonstrator to whom the customer has been exposed.

The salesman who entertains any very serious hopes of a casual drop-in customer returning to single him out at the time when he is ready to buy, is regarded as an innocently trusting soul by everyone, including the one with whom he fondly hopes to do business. Sometimes they come back. But the times that they are never seen again—these occur with a monotonous regularity that makes every ledger in the establishment thirst for its quota of red ink.

But about the sale. What happened that the good prospect was not sold a stove from the large and varied selection, and sent on her way rejoicing?

The secret was this: *She didn't hear a word that was said.* No—the lady was not deaf, and the courteous demonstrator was talking all of the time. But something else in that elaborate showroom was creating a din that even the best of salesmen would be hampered by. In the case of our ambitious young employee in question it quite completely floored him.

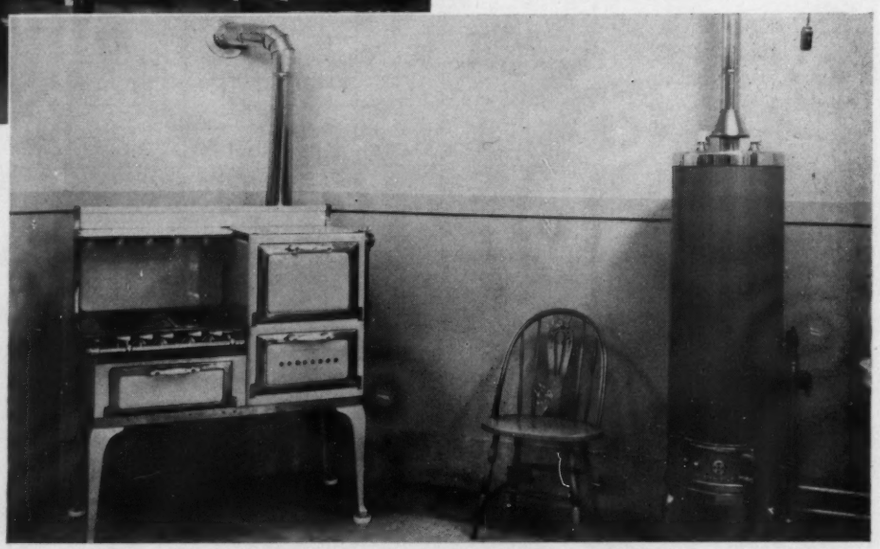
And the din, which was able to drown out every word that was said, was caused by nothing less than the display room itself.

Imagine the picture: Coal stoves, wood stoves, gas stoves, combination stoves with or without trash burners, stoves with open or closed tops, white ones, black ones, every make, every price, every size—all lined up around the walls. Crowding the small booths to overflowing, apron touching apron, each detracted from the appearance of and drew attention away from its neighbor. And each one clamored for attention.

Is it any wonder that the buyer, as her eye was caught first by one feature and then by another, found herself grow-

(*Continued on Page* 31)

Showing by contrast the effectiveness of simplicity in display. The illustration above introduces too great a variety of merchandise.



Below: An orderly display which appeals through its simplicity and its domestic background. Photograph courtesy of Pacific Gas and Electric Company.

The Natural Gas Industry *in* Montana

Abundant Resources Bring Promise of a Brilliant Future for Development of Natural Gas Service in Rocky Mountain Region

By A. H. SIKES*

General Manager, Great Falls Gas Company, Great Falls, Montana

THE wealth of a state depends to a great extent upon its natural resources and the intelligence and persistency with which they are exploited. In the Rocky Mountain region the first natural resources developed were the mines, and their wealth of minerals has built this wonderful region. There followed the development of electric power and the discovery of oil, and with the oil came natural gas.

Most Efficient Fuel

Natural gas is the most efficient fuel ever appropriated to the use of man. It is used in the largest industries and in the most modest homes. No other utility approaches as close to all the people as gas, for it cooks their food, heats their homes and furnishes a perfect light, all at a cost as low as and in most instances lower than any competitive fuel.

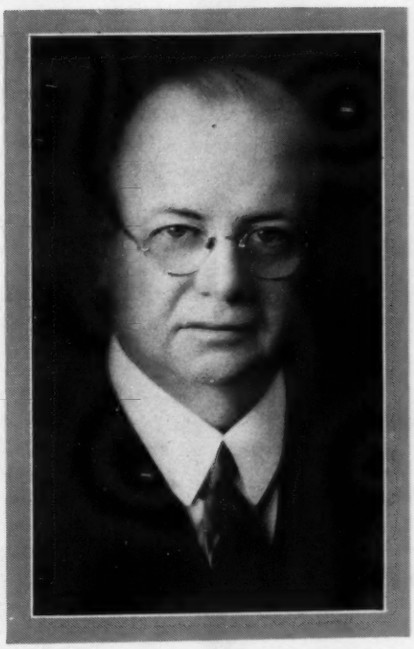
The natural gas industry in Montana is still in its infancy and a great future lies before us in this field. For example, the city of Shelby in three years' time and without manufacturing industries has built up a load of 100 million feet per year and natural gas has absolutely displaced all other fuels.

The principal states served with natural gas in the Rocky Mountain region are Wyoming and Montana. Colorado has some natural gas but it is just being developed and is still in the experimental stages. In Wyoming there are seven communities which are enjoying the benefits of natural gas.

In Montana the following communities have natural gas service: Baker, Billings, Glendive, Havre, Shelby, Wibaux, Miles City, Terry and Ismay. The development of a large system to supply the principal communities of the state is in the promotion stage yet.

Existing Systems in Montana

Two systems have been developed in Montana that cannot be called small, as they serve a number of communities. One of these systems is the Northwest Public Service Company of Wibaux, Montana. Its system is comprised of 165 miles of pipe lines and 4 pumping stations supplying Miles City, Terry, Ismay, Glendive and Wibaux, Montana, and Beach, N. D., with annual sales of three billion feet. Another of these systems is the one which supplies



A. H. Sikes

Billings and several other communities. This source of gas for Billings is drawn from the Wyoming fields.

There are extensive known gas fields in Montana with a rather large daily capacity. Before a very large natural gas system can be developed, it is necessary to exploit other fields and increase the size of productive area in the known fields. More wells must be drilled in the future, hundreds of miles of pipe line laid, distribution systems built and others enlarged so as to build up a great natural gas system that Montana will have in the future. Montana has just started the development of a natural gas industry and a very bright future lies before us.

With the development of a natural gas system in Montana more industries will be brought into the state and present industries will increase production through the use of this efficient fuel. More people will come to Montana with the advent of new industries and new business institutions will be opened in various cities of the state. This means added prosperity for those who are already in business in Montana and this is something in which we are all interested. Not only will it increase the prosperity of the state; it will also make it a better place to live as we will be rid of the smoke and dirt caused by the use of other fuels. Thousands of dollars will be saved annually by the business men and citizens of our communities by the abatement of smoke caused by other fuels.

Gas for Great Falls

The piping of natural gas to Great Falls has been in the minds of the citizens of this community for many years. Periodically some promoter either with a small gas well, or with the hopes of one, usually the latter case, has obtained publicity in the papers and for a time the people's hopes have been raised only to be disappointed in the end. The recurrence of such incidents has led many to believe that they never will enjoy the benefits of natural gas.

There are extensive known gas fields within 100 to 150 miles of Great Falls in which wells producing 11½ million to 20 million cubic feet per day by actual pilot tube test have been brought in. Competent engineers and geologists have investigated the fields and have made favorable reports. It remains for the fields to be drill tested for area to prove the engineers' assumption before the pipe lines can be financed. This drill testing is now fairly assured.

The cost of transmission lines of sufficient capacity to serve Great Falls is approximately $20,000 per mile, including compressor stations and regulator stations. The size of pipe required will probably be from 12 to 16 inches. Routes which have been surveyed do not cross any insurmountable obstacles and the cost of laying pipe will be normal.

Analysis of Gas

Tests of gas in the available fields show the following results:

Methane, 72% to 92%.
Ethane, 5% to 10%.
Hydrogen sulfide, none.
B. T. U., 950 to 1000.

Great Falls possesses a peculiarly favorable market for natural gas which

(*Continued on Page* 42)

**Excerpts from a paper prepared by Mr. Sikes and read before the first convention of the recently organized Montana chapter of the Rocky Mountain Oil and Gas Association by Paul W. Ernst, auditor of the Great Falls Gas Company.*

Gas Appliance Students Hear Able Discussion *of* Distribution *in* Second Lecture

By William M. Henderson

Wm. M. Henderson

STRONG interest is being shown in the series of lectures on the selection, use and sale of gas appliances which is under way in Los Angeles. The series, conducted by the Gas Appliance Association of Southern California under the auspices of the extension division of the State University, began on January 12, two lectures being given on that date. "Gas Manufacture" was the subject of the first, delivered by Walter M. Berry, executive engineer of the California Gas Research Council, who is directing the whole course of lectures. This paper was summarized by Mr. Berry in the January issue. William M. Henderson, superintendent of distribution for the Los Angeles Gas and Electric Corporation, discussed "Gas Distribution" at the January 12 session of the gas appliance course, and a review of his lecture appears below. These two introductory lectures provide a much needed background of knowledge of gas utility problems; ensuing lectures deal more particularly with the gas appliance field, and will be published in this journal in the order of their delivery.

GAS distribution has developed into a problem of transportation. Originally, the gas works was located in the community to serve only the congested sections. The distribution was then confined to a limited amount of piping; and the distribution pressure at all times remained under the control of the plant operator. Improvements in gas-distribution practice have, however, enlarged the area within which gas can be economically distributed, and we now find gas available even in the most distant suburbs of our larger cities.

Estimating Demand

To render satisfactory gas service, the consumers' demands must be determined. This is not the maximum capacity of the appliances installed on the premises, but something less, seldom, if ever, exceeding 30 per cent. In fact, the average domestic consumer uses about 70 cubic feet per maximum hour, if the home is completely gas equipped. Consideration of the individual consumer's requirements should be made for the season of greatest demand—that is, the month of February. A study of the consumer's use of gas is made by a clock-meter, which registers the amount of gas used and the hour. After determining the demands of the individual gas consumer, a further study must be made to analyze the characteristics of a group of consumers. There is a certain diversity factor that enters; that is to say, all consumers do not use gas at the maximum rate simultaneously. This factor aids the problem of distribution design. It is difficult to determine the relation exactly; but by observations, some idea can be had so that peak hour demands can be estimated for the consumers on each block. These, in turn, can be computed for whole districts, and then for the entire system.

Thus, the distribution system is built on the diversified maximum demand of the consumer group. This fixes the capacity and determines the size and pressure of the means for transporting the gas from the source of production to the centers of utilization.

Pressure Standards

There are various other elements that enter into the problem of gas distribution, all of them essential to the rendering of service. The most important is pressure. As the system is built to serve the appliances of the consumer, their satisfactory operation determines the quality of service rendered.

The pressure standard established by the California Railroad Commission under G. O. 58 provides:

"At the outlet of the consumer's meter, the pressure must not be less than 2 inches nor more than 12 inches of water column. Each utility must establish a standard pressure, and the pressure at any consumer's service must not vary more than 50 per cent above or below the standard, and no such variation shall be more than 4 inches; nor more than 2 inches in a 15-minute period."

High pressure—as the term is applied to gas distribution—is the storage or conveying of gas under pounds pressure. High pressure is a convenience, and like all such may be readily abused. In fact, high pressure, though a good servant, is a hard master. As a means for transmitting gas through long-distance pipes, high pressure serves a most useful purpose. For distributing gas direct to consumers, it has a limited value, depending upon the concentration, per mile of main, of the consumers served. It is preferable to use the high pressure to transport the gas, and the low pressure for distribution to each consumer group.

Pressure Producers: The Gas Holder

The importance of pressure, once established, suggests the need of producing pressure. The simplest means is by the use of the gas storage holder. By construction, this holder is so built that a pressure is exerted at all times on the gas contained therein. This pressure is anything above atmospheric, depending upon the design, seldom, however, exceeding 15 inches of water column.

Distribution by holder pressure is limited by various factors. A small gas company may find sufficient for their needs the pressure exerted by the gas holder; or such may be ample to meet the requirements of the night load on the low-pressure system of a large company. Therefore, it is evident that demand, area covered by system, and size of distribution pipes all control the limits of use of the gas holder.

The Booster

When we step beyond the service of the holder, then direct mechanical means are necessary to produce pressure.

The simplest form of booster is a centrifugal blower. This meets the requirements up to pressures of about one pound, on the light-weight type operating at relatively slow speeds. For pressures up to three pounds, this style blower is designed for higher speeds and heavier construction. A step further with this type blower, by using multiples of rotors, will develop a pressure up to 10 pounds.

The Compressor

In dealing with high pressure, the usual reciprocating type of piston compressor is adapted to meet the service. This is the standard form of air compressor, with the slight modification of a manifold to convey the gas to the compression cylinders. Compression is accomplished by stages: a single stage is 60 pounds; a second compression is necessary for higher pressure; and so on.

Pressure Control

The importance of uniform pressure has been indicated; therefore, the control of pressure is appreciated. The types of control apparatus fall under three classes: (a) station governors; (b) district governors; and (c) service

regulators. The station governor is located in the pipe line on the works outlet. In construction, it is a duplication of a valve, located in the body of the governor, and all gas passing in is subject to control by the movement of the valve.

District Governors

The selection of a district governor depends upon the design of the distribution system. If the area of supply is great, and pressure cannot be controlled from the gas works, then it will require some means for transmitting gas to centers of demand in order to meet the consumers' requirements.

Either low or high pressure may be used on the transmission main operating under those conditions above described; local conditions will determine the choice. If the distribution is by low pressure, and it is necessary to support the pressure at various intervals, then the transmission line is tapped and gas supplied to the system through a governor. This governor is constructed on the same principle as the station governor.

Service Regulators

High pressure as a means of distribution is quite universally practiced. Such pressure must be placed under control before it is convenient and safe for use on the consumer's appliance. This is made possible by use of the service regulator.

Flow of Gas

Pressure is the all-important element in the movement of gas; it is the pressure drop, or difference in head between inlet and outlet of a pipe, that accounts for the movement of gas through the pipe. Factors that influence the discharge can be grouped under the four heads:

1. Pressure drop.
2. Diameter of pipe.
3. Length of pipe.
4. Density or weight of gas; i. e., specific gravity.

The effect of the various factors on gas flow can be set forth in these illustrations:

1. Four times the pressure—double the discharge.
2. Four times the length—half the discharge.
3. Four times the length—four times the pressure to maintain constant discharge.
4. Four times the diameter—32 times the discharge.

Though the diameter of the pipe has the greatest influence on quantity flow, in practice, the length of the pipe is of greatest importance.

The choice of high or low pressure is dependent upon local conditions. The decision rests on the extent of saturation of the area to be served, with proper consideration of distance from source of supply, and possible future development. Present design would indicate that the economic limits of low pressure are reached when the consumer density is about 100 per mile of pipe. The final choice will, of course, rest on circumstances; but the important facts to assemble are those dealing with investment and operating costs.

High-pressure systems are built with smaller pipe, representing lower construction costs per mile; to offset this, there must be added pumping equipment and the necessary operating charge to maintain pressure.

Low-pressure systems represent a greater investment in pipe, as the diameters are larger; however, there is little, if any, operating charge for pressure maintenance. As the fixed charges —interest and depreciation on the usual low-pressure system per mile of pipe— are higher, due to greater capital costs, these are sufficient to increase the over-all cost of low pressure. The greater the number of consumers on a low-pressure main, the less the unit over-all cost; for each consumer is not the burden that a high-pressure consumer will be on a high-pressure system.

Reference has been made to the fact that distribution of gas is a problem of transportation. It is the moving of large volumes of gas, to meet peak demands, to centers of consumer groups, that appears to require the greatest study.

Principles of Design

By setting forth the principles involved in design, it will be possible to illustrate the importance of the transportation phase.

To serve the individual consumer, we need consider only the proper size of service pipe, and the meter size. The requirements in this respect can be closely estimated, and ample capacity is available in the minimum size service pipe to meet the demand. When two and more consumers are involved, such as exist on any resident street in the city, then there is injected an unknown factor. We may know with a close degree of certainty the actual maximum demand for gas that each consumer will require; but there is little probability of all consumers on a block demanding the maximum at the same moment of time. This fact must receive attention, for if we build for a simultaneous demand on the part of all consumers, there is no doubt that the selected pipe sizes will be far in excess of requirement. This variation in demand is referred to as "diversity factor"; and the actual use of gas by any street or group of consumers is properly termed the "coincident demand." Considerable study of local conditions are necessary to furnish figures on this latter factor; but they are essential to a proper solution of the problem.

The consumers on any block are dependent on the

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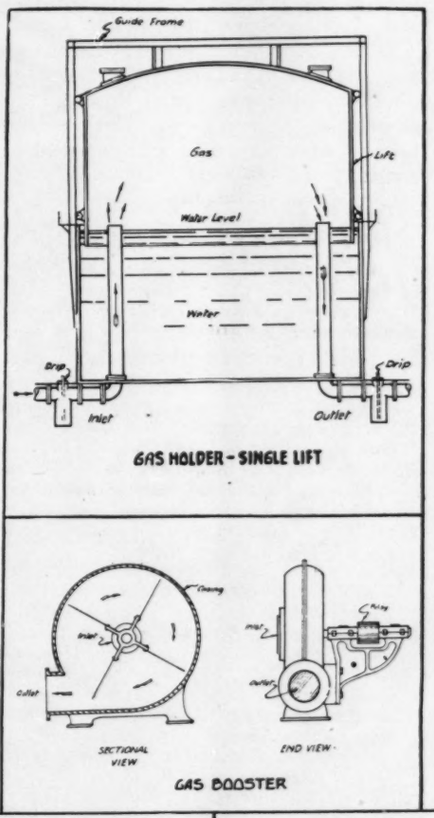


These diagrams, in the form of lantern slides, illustrated Mr. Henderson's lecture.

PACIFIC COAST GAS ASSOCIATION

A Department Conducted by Clifford Johnstone, Executive Secretary

Accomplishments *at the* San Diego Meeting

THE attendance at the San Diego sectional meeting of the Association exceeded all expectations. There were 106 committeemen in the four conferences on Feb. 18, and about 165 at the general meeting on the 19th. That nearly everyone stayed for the banquet is proved by the actual count of 147 tickets sold.

The Association owes a great deal to M. F. Raber and L. M. Klauber of the San Diego Consolidated Gas and Electric Company for the excellence of the arrangements made, and to R. S. Ruffin who provided the banquet program. The gas plant luncheon of ham, beans and pie was very notable, and the drive and luncheon for the ladies was another courtesy of the local company that was much appreciated.

The committee conferences revealed that the research into the problems assigned for the year is progressing satisfactorily in most instances. Those committees which are behind in their work should take warning from the action of the board of directors in instructing the section chairmen to limit the papers and reports submitted to the next convention to those which are complete and which are of sufficient value to warrant their receiving a place on the program. The program for the convention is to be so arranged as to allow more time for discussion than there has been in the past.

The Commercial Section decided that it would not be feasible to hold an educational gas appliance exhibition in connection with the convention. This report was received with regret by the directors, as public education and the acceptance of gas fuel would have been greatly furthered by an exhibition of the right sort. The failure of the exhibition plans makes it unnecessary to hold the convention in the city of Los Angeles and President Schafer requested director W. M. Thompson to investigate the possibilities of Pasadena, where it is thought the delegates would be held together better.

The special Arizona meeting of the Association was endorsed by the directors and in all likelihood the meeting will be held in Tuscon on April 16 and 17. These dates will be verified in the April issue. The secretary was instructed to proceed to determine a date for the Northwest sectional meeting in Portland. As there is a possibility of the convention date being set in August again it is desirable that the Portland meeting be held either in May or early in June in order not to conflict with convention arrangements.

The Orange Star Plan of the American Gas Association was discussed and endorsed in the Commercial Section and chairman C. M. Grow described it both to the board of directors and to the Association as a whole at the general meeting. The plan was enthusiastically received and the Commercial Section was assured of all possible support in the efforts it will make to tie in with the plan and develop it on the Pacific Coast. The Gas Appliance Society of California, the Gas Appliance Associations of Southern California and of Portland are admirably equipped to further the Orange Star plans and will be asked to assist.

New P.C.G.A. Members

FOLLOWING are the names of a number of new Class C and Class B members which have joined the Association recently:

CLASS C, INDIVIDUALS

C. A. Appelt, Foreman Gas Distribution, Pacific Gas & Electric Co., Petaluma, Calif.
P. A. Bailey, Statistician, San Diego Cons. Gas & Electric Co., San Diego, Calif.
B. B. Beckett, Rate Engineer, Pacific Gas & Electric Co., 245 Market Street, San Francisco, Calif.
H. R. Bray, Auditor, Western States Gas & Electric Co., Stockton, Calif.
Ray C. Cavell, Supt. of Record Dept., San Diego Cons. Gas & Electric Co., San Diego, Calif.
T. K. Caughey, Foreman, Pacific Gas & Elecric Co., 17th and Clay Sts., Oakland.
Paul A. Chaillie, Timekeeper, Los Angeles Gas & Electric Corp., Inglewood, Calif.
E. S. Cole, Div. Supt., Midway Gas Co., Station R, P. O. Box 475, Ventura, Calif.
Guy Corfield, Asst. Chemist, Los Angeles Gas & Electric Corp., Whittier, Calif.
A. B. Curtis, Gas Inspector, Pacific Gas & Electric Co., Sacramento, Calif.
Elliott Davis, Jr., Pacific Gas & Electric Co., 17th and Clay Sts., Oakland, Calif.
Louis H. Dell, Supervisor of Employees, Southern California Gas Co., 1700 Santa Fe Ave., Los Angeles, Calif.
H. W. Drake, Garage Supt., Portland Gas & Coke Co., Portland, Oregon.
A. E. Englebright, Pacific Gas & Electric Co., San Rafael, Calif.
D. E. Farmer, Foreman Meter Shop, Portland Gas & Coke Co., Portland, Oregon.
C. G. Fiscus, Commercial Dept., Western States Gas & Electric Co., Stockton, Calif.
A. R .Foster, Supt. of Collections, San Diego Cons. Gas & Electric Co., San Diego, Calif.
L. A. Fulton, Pacific Gas & Electric Co., 17th

(Continued on Page 38)

A Notable Adjunct *to the* Association

A NOTABLE instance of what may be done by gas company members to further the interests of the Association and the gas industry is the formation in the Los Angeles Gas and Electric Corporation of the L. A. Service Group of the Pacific Coast Gas Association.

The possibilities of such subsidiary organizations are tremendous and their formation in other companies is strongly recommended. If any co-operative organization is to prosper long, it must be sufficiently useful to its members to justify the funds and time devoted to it; yet it is the members themselves who must create this usefulness. In this seeming paradox lies the inherent weakness of all co-operative organizations, for if all the useful functions are transferred to a strong, paid, central organization the co-operative movement has in truth failed and been supplanted by a trade expert supported by a number of clients. There is only one royal road to continued co-operative success and that is continued interest. In short, results are in proportion to the work done by members and the work done by members is limited only by their interest.

Therein lies the importance of the movement started by the Los Angeles Service Group. It will add to the usefulness of the Association because it will create interest in the problems of the gas industry. To be more specific, its members can discuss the application of recommendations of the Association to the needs of their company, they can suggest to the Association problems they wish solved, and they can see that members are placed to advantage on committees with the result that they will be interested and not begrudge the necessary time. One concrete example of the all around importance of the movement is that the membership in the Association among employees of the Los Angeles Gas and Electric Corporation has been increased by fifty per cent.

D. L. Scott is chairman of the group and F. E. Seaver is secretary-treasurer. Mr. Scott is manager of public relations for the Corporation and Mr. Seaver is assistant secretary. They are supported by an able executive committee which includes Messrs. H. L. Masser, gas engineer; Frank Weiss, manager of new business; Wm. M. Henderson, superin-

tendent of gas distribution; Samuel Poorman, Jr., attorney, and T. N. Kellett, superintendent of gas manufacture. A committee on personnel and committee assignments has been appointed by the chairman. This committee is headed by Wm. M. Henderson aided by Frank Weiss, T. N. Kellett, O. L. Moore and E. N. Simmons. It will have the very important function of aiding in the selection of committees and of helping committee men to promptly and efficiently carry on their work.

Appliance Certification Committee Bulletins

PURSUANT to an apparent necessity the last convention of the Association passed a resolution authorizing the appointment of a committee on appliance certification. This committee was appointed immediately following the convention and has been engaged in gathering appliance information from all available authorities.

The committee requests that members of the Association report to it the name and make of individual appliances which are believed to be hazardous, so that investigations now in progress, leading to the publication of a list of reputable, safe gas appliances, may be facilitated.

APPLIANCE CERTIFICATION BULLETIN NO. 1

Upon the advice of its Appliance Certification Committee the Pacific Coast Gas Association recommends as follows:

Flexible Gas Tubing

Pursuant to information issued by the American Gas Association Appliance Testing Laboratory under date of February 5, 1926, the following types of flexible gas tubing are approved when used under normal conditions:

List of Approved Types of Flexible Gas Tubing

Type	*Manufactured by*
3/8"	Gaspruf Stove Tubing with Eureka Ferrules..Atlantic Tubing Co.
5/16"	"W" Gas Tubing with Eureka Ferrules..Atlantic Tubing Co.
5/16"	Gaspruf Stove Tubing with Eureka Ferrules..Atlantic Tubing Co.
5/16"	Kantleke Tubing with Aluminum Ferrules crimped on Chicago Tubing & Braiding Co.
5/16"	Evertite Tubing with Aluminum Ferrules crimped on Eastman Mfg. Co.
5/16"	Indestructo Tubing with Aluminum Ferrules crimped on Federal Tubing Co.
5/16"	No. 324 Sta-Tite Gas Tubing with Shrader Ferrules New York Gas Tubing Co.
5/16"	No. 325 Sta-Tite Gas Tubing with Aluminum Ferrules crimped on.....New York Gas Tubing Co.
5/16"	Penflex Metal Hose with Aluminum Ferrules crimped on Penn. Flexible Metallic Tubing Co.
5/32"	Titeflex Metal Hose with Shrader Ferrules.....Titeflex Metal Hose Co.
5/16"	Titeflex Metal Hose with Shrader Ferrules.....Titeflex Metal Hose Co.
1/4"	Titeflex Metal Hose with Shrader Ferrules.....Titeflex Metal Hose Co.

APPLIANCE CERTIFICATION BULLETIN NO. 2

Upon the advice of its Appliance Certification Committee the Pacific Coast Gas Association recommends as follows:

Solid Plates Substituted for Opengrate Tops on Gas Ranges

The practice of installing solid plate tops over the top burners of gas ranges designed to operate with open grid tops cannot be too strongly condemned.

The placing of a solid plate over such burners entirely changes the conditions of use and affects the safety of the range by interfering with the complete combustion of the gas. Authoritative information showing the danger to the life and health of the public in the use of devices in this class leads the Association to withhold its approval.

Members of the Pacific Coast Gas Association are requested to protect the public by discontinuing the use of such devices. Nothing in this Bulletin should be interpreted as reflecting upon the safety of gas ranges with solid tops properly designed and manufactured as an integral part of the range.

A Good Record of Safety

WITH some million and a quarter homes and factories served with gas in 1925, implying intimate and continual contact with possibly six million persons, the Pacific Coast Gas Association has been able through press clipping bureaus to obtain a record of only 170 accidents attributed to gas.

It is probable that gas is actually responsible for a lesser number than this, as the tabulations below are based upon newspaper accounts always written in haste and often without investigation. It is unfortunate that gas companies fail to realize the importance of conducting their own investigations in all reported accidents involving gas, as in many of them occasioned by other agencies and in those where gas is at fault, we could accumulate knowledge permitting the development of preventive measures. There is evidence that about 10 per cent of the accidents reported were from other causes than gas. One death was the result of diabetes, and two others from apoplexy. Three were caused by heart failure, but in falling the victims broke or pulled loose gas hose connections. One explosion was of gasoline and another of an oil stove. One fire was started, not by gas, but by oily rags. In many others gas was only a contributing agent, the real cause being drunkenness or the almost inexplicable carelessness of the victim. Unvented water heaters exacted their customary toll.

Let it never be said that the gas industry has left a stone unturned to make the use of gas absolutely safe. With testing laboratories and appliance certification and installation ordinances we will doubtless remove the source of many accidents, but the crying need is for a common sense education of gas users. To guide their educational measures, gas companies should carefully investigate all accidents, no matter how trivial.

The list of 1925 accidents attributed to gas, classified as to cause, follows:

Asphyxiation:	
Leaks	1
Hose disconnected or leaky	11
Products of combustion	22
Gas from appliance	6
Open jet	12
No reason given	1
Partial Asphyxiation:	
Products of combustion	18
Gas	
Flame blown out	7
Leaks	3
Open jets	7
Miscellaneous	5
Explosions:	
Leaks	
Fatal	2
Not fatal	15
Careless Lighting	
Fatal	3
Not Fatal	14
Faulty appliance	1
No reason given	10
Fires:	
Overheating of woodwork	10
Ignited leaks, misc.	5
Ignited leaks, from tubing	2
Clothing in flame	
Fatal	4
Not fatal	7
Gasoline near open flame	3
Miscellaneous	1
Total	170

News Versus Facts

MUCH has been written and said about the "power of the press." Our newspapers are woven intimately into the fabric of our daily lives; they are read by young and old, rich and poor, men and women; they form a successful medium for carrying local advertising; and without a doubt they are, for the average man and woman, the only source of information upon which to form opinions on public matters. With all of these contributing factors the "power of the press" must be a tremendously vital force. Nevertheless the matter is debatable.

We have, as contradictory evidence, the spectacle of a widely read chain of newspapers, ably edited, strongly partisan, and full of fight, yet losing nearly all of its battles. All of us, at times, have experienced a feeling of disgust

(*Continued on Page* 40)

EDITORIAL

On to Arizona!

WHEN President Schafer tapped his gavel and called the San Diego sectional meeting of the Pacific Coast Gas Association to order on February 19 a highly gratifying representation of the membership was present. With a similar meeting looming in the near future for Arizona the San Diego turn-out is especially encouraging.

Dates for the Arizona meeting are tentatively set for April 16 and 17. Indications are that this first Association meeting to be held away from the Coast is creating a great deal of interest in Arizona and neighboring states. It is probable that the meeting will be held jointly with the Arizona Utilities Association which has recently completed organization, and thus a good Arizona delegation of utility men is assured. Coast gas men must be there in force, for the opportunity to fraternize with gas leaders of the Southwest is too good to be lost. It is also an excellent opportunity to spread the Association gospel and add representatives of this section to the membership. Much good to the industry is resulting from Association activity, and the benefits should be diffused through all of our western field.

"In an Early Issue"

SEVERAL editorial features of uncommon interest are due to appear in the columns of early issues of *Western Gas,* and we can at this date give our readers only a foretaste of their contents. Our April issue will contain at least two articles of major importance to our readers whose interests are primarily with the appliance end of the gas industry. E. L. Hall, general superintendent for the Portland Gas and Coke Company and chairman of the Appliance Certification Committee of the Pacific Coast Gas Association, will give his views on the certification problem and review his committee's activities as far as they have progressed. Everyone who markets gas appliances in the West, if he is alive to his future interests, is following the steps which are being taken throughout all of the gas industry to meet the recognized need for safe and efficient appliances. A word from one who is in the forefront of this work will be timely and of marked interest.

Paul Overton, general counsel for the Los Angeles Gas and Electric Corporation, will be the author of another feature which appliance men will read and remember, since it concerns an acute problem of appliance merchandising. What is a dealer's liability to his patrons in installing gas appliances in case of accident; can such liability be covered by insurance? These are questions which meet every dealer and which Mr. Overton will answer, in our April number.

Claude C. Brown, gas engineer for the California State Railroad Commission, will undertake to explain just where the consumer's dollar goes, in a series of two articles on gas costs. The first, to be published in April, will deal with manufactured gas, and the second with natural gas. Every stage at which an additional element of cost is added to gas service will be treated, and the result will be an orderly array of facts on gas costs which should be extremely useable in almost every department of the gas utility.

Speaking with One Voice

ON the Pacific Coast there are three strong and well organized groups of gas appliance men, one in Portland, one in Northern California and one in Southern California. Together they represent a considerable slice of the appliance industry on the Coast.

Interest in a closer alliance of these three groups is on the growth, for it is evident without much thought that there are many problems of the appliance industry which are identical, and other problems which are very similar, in all three localities. Whether any definite union of organization of the three is practicable or even desirable is a question which can be decided in the future, but it can be said without hesitation that some means for allying the three and enabling them to speak with one voice on common problems should be devised.

A New Face to the Public

INTO the oblivion which engulfs every policy that fails to pay dividends has gone the ancient "public be damned" attitude of the gas utility. Almost every day some company brings out a new departure aiming to please the public. Thus the Utah Gas and Coke Company of Salt Lake City broadcasts over radio for its patrons' pleasure; and the Pacific Gas and Electric Company invites visitors to inspect its plants and properties, replacing the usual "no admittance" signs with "visitors welcome".

Building *a* Desirable Gas Load *through the* Gas Engine

(*Continued from Page* 13)

daily load factor as well as upon a good seasonal load factor. Hence the advantage to the utility of having its facilities in use a fair portion of the time will remain peculiar to the business.

In agricultural work an engine operates over a period of six or seven months, while larger water companies operate from eight to nine months. The third advantage to the utility then, lies in the fact that the months of heaviest operation are the summer months when additional business is desirable. What load may exist during other months is usually very small, hence, the consumption in the aggregate tends to become a good load curve flattener.

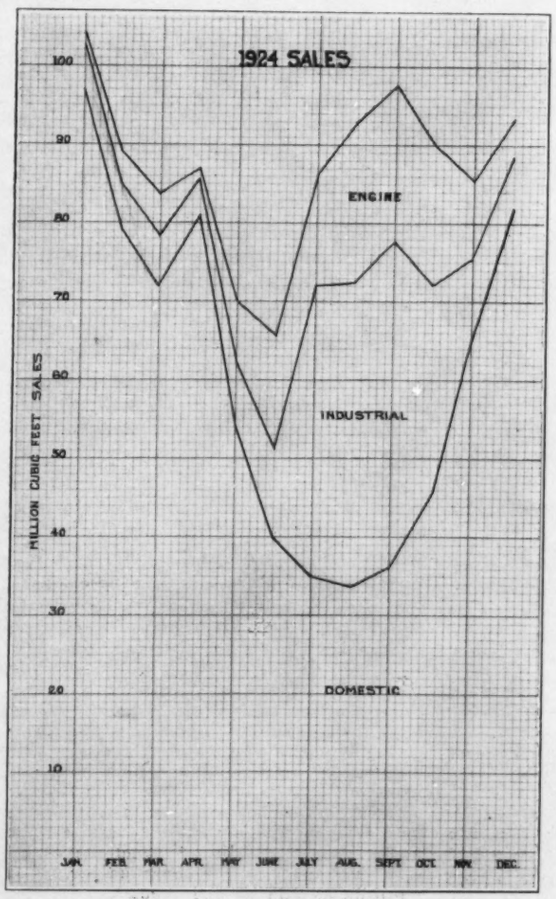
Industrial concerns operating on surplus industrial gas rates must often be shut off from gas supply during all or portions of the winter. Despite the fact that this possibility is understood at the time the contract is signed, the concern must often be re-sold on the advantage of gas each spring, a matter often difficult and at times impossible. A fourth advantage to the utility is a result of the fact that the inherent nature of the business makes of it a summer load, so that once convinced of the advantage of gas, usually the business is retained without further sales effort.

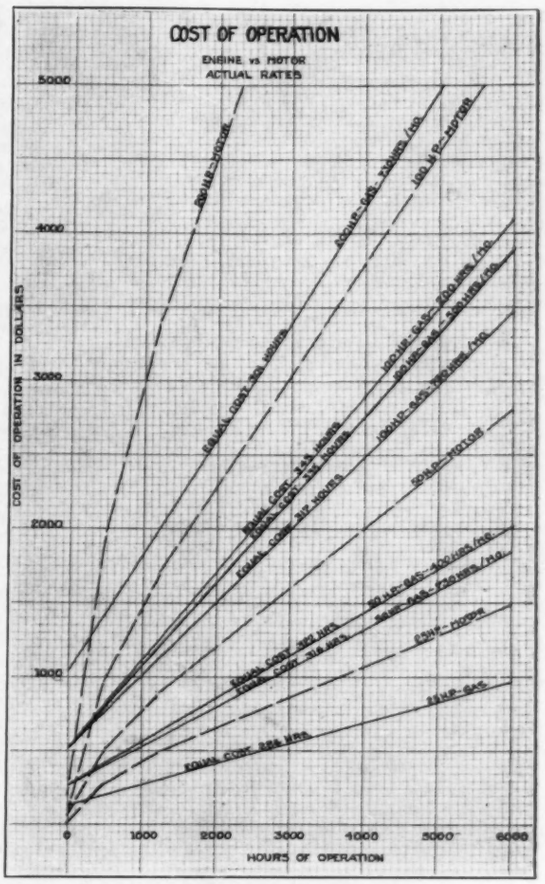
Fifth, the essential nature of the business in itself affords some assurance of continued operation.

Sixth is the fact that gas for this purpose can be sold in competition with other power at rates appreciably above the usual surplus industrial rates used to build up summer loads.

Effect on Load Curve

For the purpose of illustrating the effect of the engine load on the yearly load curve, data has been taken from one of the divisions of the Southern California Gas Company as being typical. The load has been segregated into three classes, namely, industrial, which is mainly surplus, gas engine, and the remainder, called domestic. The accompanying graph shows first, domestic, second, the total of domestic and industrial, and third, the total of all three loads. The extreme domestic slump shows plainly, although filled in part by the two summer loads. Throughout the year domestic was about 69% of the total sales, but in the summer months it was only about one-third of the total. In the summer engine sales were little more than half of industrial, yet the engine revenue was 20% greater than that from industrial sales.





General Operation

Popularly gas engines are considered unreliable, subject to shutdown from numerous causes, liable to excessive repairs, difficult to start and subject to constant attention. All of this is the result of experience with old types of engines using liquid fuel, of high speed engines on constant loads, and of the uniformly sad experience with engines operating on continual overload. These impressions are kept fresh in the minds of power users by salesmen for other equipment.

As for shut down, data collected for a year in one case discloses the fact that engine shutdowns for all causes were about one-seventh of the shutdowns of electric motors, and the time of shutdown was in about the same ratio. One installation of nineteen 160 horse power engines driving compressors experienced forced shutdown due to both engines and compressors of only 0.2 to 0.3 of one per cent. Thus, engines are proven to be one of the most reliable sources of power. Repeat installations by concerns who have operated engines 24 hours a day for the full season is proof of the success of gas engines.

Experience has taught us that engines 20 to 30 years old will operate season after season with very small repair bills. Properly cared for and given proper replacements, engines will operate much longer, so that salvage value at the end of 20 or 25 years is considerable. Never the less, we often figure the life of an engine as 20 years, showing depreciation in the statement of overhead as inseparable from repairs. That is, an engine will depreciate much faster than it otherwise would, if adjustments and repairs are not made as needed. Therefore, allowing 20 years for the life of the engine, depreciation and repairs should be taken as 8% a year.

Gas engines are invariably equipped these days with an air starting unit, so that starting is far from difficult.

The four outstanding features of improvement made in recent engines, namely, high tension ignition, forced feed oiling, throttle governing, and air starting, have so changed engine operation that modern engines are no longer comparable with old engines. Further than this, proper muffling makes operation possible even in the cities.

It is a surprise to those not acquainted with the facts to see how little is the attention required by gas engines. Frequently one man operates several plants a mile or more apart and attends to other duties, such as water company zanjero, in addition. This is possible because the fuel supply is constant, gas does not foul the engine, and the design is such as to afford safe continual operation.

Types of Engines Encountered

For our purpose engines usually encountered may be classified as follows:

1. Slow speed engines with head and mixing box designed for gas.

2. Slow speed engines converted from liquid fuel to gas.
3. High speed engines of tractor type.
4. Automobile engines using gas as fuel.

The most economical, and in the main the most satisfactory engines are the first class. Converted engines can be made to operate fairly satisfactorily from a point of fuel economy, but conversion must be properly done. Too often this is not given attention, and only mediocre results are obtained. These engines will operate on gas as they stand, but with a high fuel consumption. Because of the fact that they have been designed to give rated power with a practical maximum of power from the fuel-air mixture at compression pressures in the neighborhood of 80 pounds per square inch the gas-air mixture is slow in burning. The explosive power of the mixture is not utilized and combustion often continues to the point of exhaust. It is therefore necessary to increase compression pressure to 100 or 110 pounds, by inserting a plate bolted either to the piston or to the inside of the head.

High speed engines will not as a rule be satisfactory on constant load, the fuel economy is not good and more constant attention, and more periodic care and repairs are required. Low first cost of course often makes it feasible to operate such engines and replace them oftener than would be necessary with heavier engines. This is true particularly of old automobile engines, picked up at small cost. However, from the standpoint of the utility they are not satisfactory. It is too easy for the owner to become tired of having to attend to such an engine and install a motor. With years of service from a heavier engine the owner is himself the utility's best protection for continued business.

First Cost and Comparisons

In comparison with liquid fuel engines, and not here considering deisel or semi-deisel engines, gas at 40 cents per thousand is equal to liquid fuel at about 3.6 cents per gallon. It is apparent that gas, where available, has the engine field largely to itself.

On the average, gas engines properly installed, with air starting unit, muffler, gasometer and so on, complete and ready to operate, cost from $55.00 to $66.00 per available brake horse power. Electric motors with starting and protective devices cost in the neighborhood of $15.00 per horse power. Of course the prices per horse power vary with the size of the plant, but a comparative price of four to one may be taken as a fair average for the purpose of discussion.

In addition to first cost, a new installation may, for example, require a larger house for an engine than for a motor. Further, an engine may be changeable with additional labor. In most cases however, a pump must be attended to periodically, in which case the operator may see that the engine is functioning properly and go about his work. The proper sort of engine in this case should require no extra labor charge. In water companies, additional labor may be an item of some moment, or may be cared for by paying the present attendant a slight increase in salary, or it may amount to nothing.

It is easily seen that conditions peculiar to the individual case will determine the charges which apply. In actual work it is of primary importance that all conditions be investigated thoroughly before an engine is recommended. Otherwise an engine may be installed where it will not be satisfactory from a point of economy. In this case injury to the engine business will result far out of proportion to the importance of the particular installation causing the trouble.

Overhead and Operating Expenses

Cost of operating includes the following:

Fixed Charges: a—Interest, b—Depreciation, c—Repairs.

Operating Charges: a—Fuel, b—Lubrication, c—Labor.

As for interest, much has been said. The fact that the Government does not allow of charging interest on invested capital when figuring deductions from taxes should seem to support the contention that to charge interest in a statement of comparative costs is unfair. In a business the matter is quite apparent. If a man invests in his business he expects a return which will warrant that investment. Otherwise he would put his money out at interest. In other words he is being paid for his business risk and business management. In the case of an engine, the owner installs it only after he has satisfied himself that it will pay for itself in the assumed period of life, and will net a return over and above that amount. Otherwise he would better use a motor.

Therefore, since the engine is paying for itself and also netting a return, it is fair that a depreciation fund should be established. If this is not done the money is being used for something else and should be expected to be able to earn the usual interest rate at least. Hence, setting aside, on the books at least, 5% of the first cost each year, and crediting it with the normal interest earning power, the total interest earned for the period of the life of the engine will just equal interest charged against the engine year after year as it depreciates.

A good engine may be expected to give a thermal efficiency of about 25% and a mechanical efficiency of 90%. Properly designed, an engine will develop a brake horse power on 9,500 to 10,000 B.t.u. With 1000 B.t.u. gas the consumption will be 10 cubic feet per brake horse power hour; with 500 B.t.u. gas, 20 cubic feet, and so on until the gas content lowers to about 150 B.t.u.

A slow speed engine properly designed and properly operated will consume one gallon of oil costing from 20 to 35 cents per gallon, for each three thousand or more horse power hours of operation. Other engines may use a gallon for each 750 horse power hours.

An electric motor may be assumed to operate with an efficiency of about 90% under good conditions. An engine will vary from the above stated 9,500 B.t.u. according to the load. The fuel consumption efficiency should be about 98% at 87.5% load; 95.7% at 75% load and 90% at 62.5% load. Of course the speed of an engine may be decreased in proportion to the load and thus retain nearly the same efficiency as at full load. This is true within reasonable limits. In fact the flexibility of an engine is one of its most desirable features.

In the construction of the accompanying graph showing comparative costs it was assumed that an engine would be sized 10% greater than the load while a motor would be the same as the load. The following rates were used:

Gas

First 200M per month per meter at	$0.55 per M
Next 300	0.50
Over 500	0.30

Minimum $96.00 per year.

Electric

	Rate per kwh for connected loads				
	1hp to 4hp	5hp to 14hp	15hp to 49hp	50hp to 99hp	100hp and over
First 400 kwh per hp	3.2c	2.7c	2.5c	2.3c	2.3c
Next 600	1.8	1.5	1.4	1.3	1.2
Over 1000	1.2	1.1	1.0	0.95	0.9
Minimum per hp per year	$9.00	$8.00	$7.50	$7.25	$7.00

but not less than $15.00 per year.

The item of interest was omitted, and labor charges were considered to be offset.

The point of equal cost for a 25 H.P. load is 286 hours. For 50 H.P. load operating 400 hours per month the point of equal cost is 322 hours. The same load operating full time reaches equal cost at 316 hours. A 100 H.P. load operating 200 hours a month reaches equal cost at 343 hours; operating 500 hours a month, at 355 hours, and operating 730 hours a months, at 317 hours. A 200 H.P. load operating full time reaches equal cost at 301 hours. From this it may be seen that a 200 H.P. load operating full time reaches equal cost later than does a 25 H.P. load operating only 286 hours or operating full time. This is because the two rates have no relation to each other in their decrease due to increased consumption. It will also be observed that a 200 H.P. engine load will operate for comparatively little more than a 100 H.P. motor load.

Test to Show Comparative Costs

Under many loads an engine will pay for itself in from two to four years. A test was made in one plant to show comparative operating costs. An engine and a motor were so placed that the same pump belt could be used from the motor or from the engine jack shaft. The test was made with motor for 24 hours and the engine for 24 hours, a few days apart. Rates were arrived at from average rates actually charged at the plant. The following results were obtained:

Electric

Average rate	1.129c per kwh
Consumption per hour inch	800.5 watts
Energy charge per hour inch	0.904c

Gas

Average rate	35.63c per M
Consumption per hour inch	9.92 cubic feet
Gas costs per hour inch	0.353c
Oil—Shell Red Extra Heavy @ 26c a gallon, using 3¼ gals, in 24 hrs.; oil cost per hour inch	0.023c
Labor	No extra labor required
Total engine operation:	
Gas	0.353c
Oil	0.023c
Total	0.376c

Conclusion

Total gas costs	376	41.5%
Total electric costs	904	

Engines Operating on Other Than Natural Gas

As stated above an engine will develop a brake H.P.H. on about 10,000 B.t.u. in the gas. With 500 B.t.u. gas the cost, at 40c per thousand cubic feet, would be 0.8c per H.P.H. instead of 0.4c, as obtained before. This menas that in only rare cases where gas and electric rates afford considerable margin would engines be installed. With mixed gas containing 850 B.t.u. the cost per H.P.H. at the same rate would be about 0.47c, which retains sufficient margin to afford economical engine operation in a number of cases.

General

Gas engines are established in Southern California and will continue to increase in importance. However, new business must be obtained by constant effort. Replacement of motors is being accomplished in many instances. In fact a year or two of receipted power bills often forms a stepping stone to the installation of a gas engine.

One of the best means of retaining engine business, of helping toward replacement of worn out engines, and at the same time of obtaining information leading to future business is the employment of a service man. Such a man periodically visits the plants operating, checking the operation for minor adjustments and needed repairs.

What *Is* Good Natural Gasoline? *A* Discussion *from the* Standpoint *of the* Refiner

By CARL J. VON BIBRA
Export Refining Corporation

THIS IS THE SECOND and concluding installment of Mr. von Bibra's paper on "What is Good Natural Gasoline?", delivered before the natural gasoline group session of the American Petroleum Institute convention at Los Angeles. The first installment, published in the February issue of this journal, dealt in large part with market conditions and factors which will influence the market of the future. In the latter half of his paper, published herewith, Mr. von Bibra deals with considerations which govern a refiner's use of natural gasoline, and with natural gasoline specifications. The paper reaches the conclusion that a mutual high regard between refiners and natural gasoline manufacturers is essential to the welfare of the industry, and that technical research is an outstanding immediate need.

NATURAL gasoline, as previously pointed out, is useful to the refiner in two ways. In the first place, it gives the low initial boiling point in the finished motor gasoline which is required by the present competitive state of the gasoline market. Secondly, it enables the refiner to realize a profit on the sale of certain gasoline hydrocarbons which it would otherwise be necessary to discard from the gasoline fraction because if they were all included in the finished gasoline the various intermediate points of the sales specifications could not be met.

The problem of what is good natural gasoline from the gasoline manufacturer's standpoint is simple enough. Good natural gasoline from this viewpoint is simply any kind of natural gasoline that you can sell and get money for over a period of time long enough to retire your investment and make as much profit as possible. It would appear that the question of "What is good natural gasoline from the refiner's viewpoint" would be very much more complex. This need not be true, however, because inasmuch as the natural gasoline manufacturer is anxious to make as much saleable gasoline as possible, the refiner is equally anxious to buy as much as possible of natural gasoline, or any other commodity, the purchase of which will show him a profit. If the California natural gasoline industry proposes to base the sale of its product on the temporary trying market conditions under which the refiner is suffering, this industry has a very unstable foundation. If, however, a reasonable attempt is made on the part of the natural gasoline manufacturers of California to furnish the state's refining industry with a product which it will be advantageous for the latter to buy at a good price for years to come, the natural gasoline business will be established upon a firm and profitable basis. This, then, is purely a matter of price and specification. Assuming equitable specifications, the price which the refiner can pay for his natural gasoline depends, curiously enough, on the efficiency with which his refinery is designed and operated.

Let us assume that a certain crude contains 25 per cent of gasoline as indicated by any approved form of efficient laboratory distillation. If this crude is run through an inefficient refinery and due to poor dephlegmator design and sloppy operation only 20 per cent of gasoline is extractable from the crude which meets the intermediate and end points of a certain specification, the gasoline made at this refinery will probably have a higher gravity but will also cost very much more per gallon than one made by a more efficient plant. This gasoline has to be sold in competition with the product from the most efficient refinery operating in the same market. Therefore, the owner of the inefficient refinery cannot afford to use as much natural gasoline or pay as high a price for this commodity as he could afford if his straight run naptha had not cost him so much due to inefficient crude distillation. Concurrently, the operator of a highly efficient and scientifically controlled refinery will be able to extract from this certain crude very close to the theoretical amount of gasoline which it contains, let us say the full 25 per cent represented by the laboratory distillation, or even more. By figuring on judicious blending with natural gasoline this refiner will not even stop there. He will cut a refinery naphtha which exceeds the maximum limits set by his sales specifications in several intermediate points and also slightly by the end point. Thus, having extracted from his crude as potential gasoline all the gasoline there is in it, plus a considerable proportion of hydrocarbons which would have gone into the fuel residuum or very low priced distillates, he is able to buy, and in fact until cracked substitutes are available, he absolutely must buy a relatively large amount of natural gasoline in order to blend his refinery naphtha down to meet the various intermediate and end point requirements and furnish the competitively desirable low initial point. Obviously, a refiner operating on the latter basis is able to pay a higher price for natural gasoline simply due to the fact that his straight-run costs him very much less than if he had attempted to make a finished motor gasoline from crude alone.

Judging from present probabilities, and again assuming fair specifications, it is likely that as far ahead as we can see natural gasoline in California will be worth more delivered at refinery than motor gasoline will be worth at the same refinery. How much more is a serious question. At the present time natural gasoline in Southern California is selling at an average of say 15 cents a gallon in the field with the refinery price of motor gasoline approximately 10 cents per gallon. There is very good reason to believe that with the general adoption of large scale cracking and the previously mentioned likelihood of sales of gasoline with a higher initial in the not too distant future, that this differential in price between natural gasoline and finished motor gasoline at the refinery will decrease. As the price of natural gasoline is customarily compared with the price of retail gasoline, the foregoing statement would have to be reversed to say that the price differential between natural gasoline and retail gasoline will show a tendency to increase as cracking becomes prevalent and the retail gasoline market changes from a buyer's market to a seller's market. All of this is based on the assumption that the present generally unsatisfactory methods of writing natural gasoline specifications is continued.

Natural Gasoline Specifications

As previously mentioned, no attempt will be made here to propose any standard specifications under which natural gasoline is to be bought and sold in the California market. At the same time it is definitely realized that both the refiners as buyers and the natural gasoline manufacturers as sellers are being seriously injured at the present time by adherence to poor specifications. Many specifications under which natural gasoline is now being bought and sold in

California to the tune of millions of dollars have been written without adequate knowledge of the nature of the product being dealt in and with a very obvious lack of mutual consideration between the buyer and seller. The attitude of the average buyer of natural gasoline has been to limit the natural gasoline manufacturer in every way possible in order to minimize evaporation losses as far as possible and at the same time to obtain a natural gasoline which is desirable in all other respects. The typical seller's attitude has been to obtain specifications so liberal that the gasoline manufacturer can ship and obtain money for most anything he could get into a tank car, truck or pipeline.

At the present time most natural gasoline specifications include limits on: color, gravity, end point, vapor pressure, distillation recovery, and sometimes more special tests such as initial boiling point and sulphur and gum as represented by the doctor and copper dish.

Color

There is little or no room for argument on color specifications. If the natural gasoline is desired for cold blending, its color should certainly be at least as good as that required in the finished motor gasoline. A Saybolt color of 23 to 25 is customary in California. There is no reason why any gasoline manufacturer with an adequate plant cannot make a color as good as this without difficulty. If the gasoline is run into crude oil lines or is otherwise destined for hot blending, any color should be good enough, but as the production of gasoline with a good color involves no expense or trouble for the gasoline manufacturer, the perfectly sound custom has arisen of requiring at least a 21 Saybolt color for gasoline to be used in such a manner.

Gravity

Gravity is somewhat more difficult to agree on. In the first place, the gravity specification which the gasoline manufacturer can meet depends considerably upon the quality of the wet gas he has to work with. Thus rather definite gravity limitations are set by the fields in which the natural gasoline is manufactured. For instance, in California the natural gasoline produced in fields such as Inglewood, Torrance and the San Joaquin Valley is low, ranging from 60 degrees to 75 degrees A. P. I. This assumes the manufacture of gasoline from wet field gas and not from high pressure mainline gas which has previously been put through gasoline plants. In other California fields, the natural gasoline varies roughly from 75 degrees to as high as 90 degrees A. P. I. To many buyers of natural gasoline, gravity is of no particular interest, because they buy the product primarily in order to get a low initial for their finished motor gasoline. Those refiners, however, who are buying natural gasoline for the purpose of blending to a high gravity in their finished gasoline very naturally are more interested in buying natural gasoline with as high a gravity as possible. Therefore, other things being equal, they are willing to and can afford to pay a higher price for high gravity natural gasoline than for equally good natural gasoline with a lower gravity.

End Point

In the writer's opinion, there is only one object in limiting the end point of natural gasoline and that is to protect the buyer from being sold absorption oil when the natural gasoline is manufactured by the oil absorption process. Therefore, the end point should not be placed so low that the gasoline manufacturer is unable to include in his saleable product those relatively heavy drips which come to him through his gas lines. He is clearly entitled to sell this product as natural gasoline just as much as any of the lighter constituents of the gas which he is treating. An end point of 375 degrees Fahrenheit would seem to make possible the inclusion of drips and yet exclude any appreciable amount of absorption oil.

Vapor Pressure

In attempting to arrive at vapor pressure specifications we immediately encounter difficulties. If rail deliveries are contemplated, the upper limit of vapor pressure is set by the Interstate Commerce Commission regulations. If pipeline deliveries are made, there is no particular limit to the vapor pressure other than that agreed upon between buyer and seller. The tendency in California has been for natural gasoline buyers to require vapor pressures of 10 or 15 pounds per square inch at 100 degrees Fahrenheit. In exceptional cases, vapor pressures as high as 20 pounds per square inch (the I.C.C. limit) have been permitted. The writer takes the viewpoint that inasmuch as a very large portion of the natural gasoline bought by refiners in California is cold blended with refinery naphtha, the proper limitation of the vapor pressure would be the best safeguard which the buyer has against inordinate blending losses. Vapor pressure is a direct measure of the amount of gasoline which will evaporate due to handling without further processing such as redistillation.

Despite the obvious theoretical advantages of specifying vapor pressure there are practical difficulties which have brought this specification into disrepute. It is difficult to check vapor pressure determinations against one another, even if identical apparatus is used. Also there are cases known to most of us in which the vapor pressure of natural gasoline has radically changed in transit from seller to buyer. These changes are rather difficult to explain definitely although plausible reasons can easily be advanced. The up-shot of the whole matter is that because of the possibility of the vapor pressure changing it is difficult to avoid disputes between buyer and seller. For these and other reasons the natural gasoline industry east of the Rocky Mountains has practically abandoned vapor pressure specifications for purposes other than compliance with I. C. C. shipping requirements. The probable tendency here on the Pacific Coast will be to follow suit.

A question which is often discussed in terms of vapor pressure is the inclusion of very low boiling hydrocarbons in natural gasoline. It is premature at the present time to discuss with any assurance the question of how much butane and propane, if any, the natural gasoline manufacturer should include in his product. Elaborate research work is now being conducted on this problem which should yield very valuable results in the near future. It is probable that the production of good natural gasoline in California can be very greatly increased by the proper inclusion with the pentane and higher fractions of 50 per cent or more of the butane content of the average natural gas treated. The inclusion of all the butane and even the inclusion of propane are being discussed, but the wisdom of this step is open to considerable question. In the meantime the inadequacy of our knowledge of this subject makes it inadvisable to attempt to propose at this time a reasonable specification within hard and fast limits for natural gasoline. Both the refiner and the natural gasoline manufacturer have learned much within the last year or two and unquestionably still have much to learn.

Distillation Recovery

It is in connection with the specification of distillation recovery that the most dam-

(*Continued on Page* 33)

MONTANA POWER COMPANY SPENDS $10,000 ON GAS

Expenditures amounting to $10,400 on maintenance and development of its gas system in 1925 are reported by the Montana Power Company of Butte, Montana. This represents an increase of $2,428 over the sum spent for similar purposes in 1924. Plant additions to cost approximately $1,000 are planned for this year.

SO. CAL. GAS CO. ISSUES ORANGE SHOW EDITION OF PUBLICATION

The March issue of the "Gas News," published for the employees and stockholders of the Southern California and Midway Gas Companies, was sent to all of the customers of the Southern California Gas Compnay in the San Bernardino Valley Division. This was in honor of the Sixteenth National Orange Show which has just been held in San Bernardino, of which H. C. McAllister,, manager of the San Bernardino Valley Division of the Southern California Gas Company, is president.

GAS SERVICE IS AUTHORIZED FOR IMPERIAL VALLEY

The Inland Empire Gas Company has been granted a certificate by the Railroad Commission of California to establish and operate a gas system at El Centro, Imperial county, serving residents of El Centro, Imperial, Brawley, Heber, Calexico, Mexicali and contiguous territory. The newly formed corporation will issue and sell not exceeding $375,000 of 7 per cent cumulative preferred stock, and not exceeding $205,800 of common stock for the purpose of financing the installation of such system. The commission specified that the applicant shall not expend more than $10,000 of the proceeds from such stock for the acquirement of the franchises and easements for rights of way necessary for the system.

DRY GAS DISCOVERED IN OLD SIGNAL HILL FIELD

Development of newly discovered dry gas possibilities may take place in the old Signal Hill field, Long Beach, Calif., following the completion of a well by the Deeds-Hotchkiss Syndicate whose initial production of dry gas was reported to be 15,000,000 cubic feet a day. It is understood that the City of Long Beach has contracted for the gas.

The well is located at Panorama Drive and Angeles Avenue. After failing to produce oil at 4400 feet the well was plugged back to a gas zone encountered at 2450 feet, from which the dry gas blew in. If the gas continues in quantity it is probable that other development will follow.

LETTERS ON COST ACCOUNTING ISSUED BY A. G. A.

The development of a system of cost analysis for gas companies has concerned a subcommittee of the American Gas Association's Accounting Section since the fall of 1923. As a means of stimulating interest in this important phase of utility operation the committee is issuing a series of letters on the value of cost accounting, and the letters may be had by anyone requesting them of the A. G. A.

U. S. PASSES CONSERVATION ACT FOR HELIUM

A Helium Conservation Act has been passed recently by the United States Senate under which certain natural gas areas will be reserved for insuring a future supply. It is estimated that at present not less than 500,000,000 cubic feet of helium escapes into the air from United States gas fields every year.

$5.00 TO THE BEST SALESMAN AUTHOR ON RANGES

A monthly prize of $5.00 to the salesman of gas appliances writing the best 100 word article on why women should buy new ranges or water heaters has been offered by the Gas Appliance Society of California. Articles should be submitted to 180 New Montgomery St., San Francisco.

BILLINGS, MONT. PIPELINE TO BE CLEANED THIS SUMMER

C. R. Hetzler, president of the Billings Gas Company, Billings, Montana, announced recently that the pipe line supplying natural gas to Billings from the Elk Basin fields is to be taken up and cleaned this summer by the Gallatin Natural Gas Company at a cost estimated at about $200,000. Bridger and Fromberg are also supplied by the line, which is 70 miles in length. No discontinuance of service is anticipated. Corrosion due to alkali soil is given as the reason for the work, and a protective covering is to be put over the line as it is relaid.

ARCHITECTS CONTEST STAGED BY GAS ASSOCIATION

To stimulate the interest of architects in drawing good gas appliances into house plans the A. G. A. is initiating an architects' contest open to general competition, giving a first prize of $1,000, second prize of $500, two prizes of $250 and four of $100 for winning plans for a six-room suburban house. The contest was announced in the four leading trade publications for architects. This move is the first step in the Orange Star Campaign for raising the standard of gas appliances, which is being conducted by the American Gas Association.

P. G. & E. REPORTS BIG INCREASE IN WINTER GAS SENDOUT

J. M. Dickey, engineer of gas generation for the Pacific Gas and Electric Company, San Francisco, reports a remarkable increase in the use of gas this winter, together with a very satisfactory load factor.

During the month of January the sendout amounted to more than 1,003,000,000 cubic feet. This makes an average daily consumption of over 32,000,000 cubic feet, and on the peak day of the month the sendout was 37,044,000 cubic feet. The close approach of the average day to the peak day shows a very healthy condition in San Francisco gas business. The total sendout in December was about 907,000,000 cubic feet.

SEES GAS POSSIBILITIES IN REGION OF SHELBY, MONTANA

Dorsey Hager, petroleum geologist, speaking before the Montana chapter of the Rocky Mountain Oil and Gas Association, says that prospects for gas developments in the vicinity of Shelby, Montana, are very bright. Quoting from his paper:

"It seems to me that someone is overlooking a splendid gas prospect in the area North of Shelby to the Troy Sweetgrass well. The holes can be drilled for $7,000.00 or $8,000.00 and flows from 1,000,000 to 12,000,000 cu. ft. per day have been found. The Kootenae sands are from 20 to 30 feet thick in these wells. Someday that gas area will furnish Great Falls with gas. The area is large enough for a 30 year supply at least."

VALUE OF COMPRESSED GAS IN INDUSTRY INCREASING

The value of compressed gas annually consumed in the industries of this country is said to exceed $60,000,000. There are 4,000,000 portable steel cylinders now being used in transporting the various gases used.

Spring Campaign Plans Approved *in* G. A. S. Convention February 10

A SPRING CAMPAIGN without a price appear hung on to attract the eye of the so-called buying public, was the plan approved in the Annual Spring Convention of the Gas Appliance Society of California held in San Francisco, February 10th.

Following the astute advice of the impresario of many past campaigns, the Society has decided to give Al Crane free reign in planning a campaign designed to stimulate sales throughout the entire year, instead of creating a high spot during the week, with a corresponding depression in weeks to follow.

The plan was outlined and ratified at the meeting of the board of directors of the Society in the Furniture Exchange prior to the evening session. In the evening meeting the plan was sanctioned by the entire membership.

Reports from Units

Various unit chairman reported during the afternoon. C. B. Babcock, representing the San Francisco unit, told of the results of the Peach Week, the new financial system under which San Francisco is operating, the warm air heating code and the model ordinance.

The report of the Oakland unit, as delivered by W. E. Fletcher, was not unlike that of San Francisco, inasmuch as the same general plan of organization is being followed on both sides of the bay.

Santa Rosa, according to R. C. Mosier, is giving serious attention to the turn-in stove problem, with indications that a satisfactory arrangement is about to be made.

Speaking for Sacramento Mr. Allen said that the standard code and proposal blanks have been advertised to the public to the extent that some purchasers are already insisting that the standard forms be used in their transactions.

E. M. Brickey reported progress in San Rafael, and Redding's work was declared satisfactory by Mr. Hughes.

Discuss Union of Groups

J. E. Moore of Los Angeles, and member of the independent organization in that territory known as the Gas Appliance Association was called upon, and his talk evoked a general discussion of the advisability of amalgamating the two California organizations and the Portland Society, making one big Pacific Coast body. It was apparent from the opinions expressed, however, that considerable work will have to be done by those interested in an amalgamation if one is to be effected. The main point of difference lies in the fact that the gas companies, biggest supporters of all of the associations, have different policies in regard to the matter of merchandising appliances. Messrs. Babcock, Egleston, Jackson and Johnstone were the names to make up a committee to see if a workable plan of composite organization could be evolved.

The work of Southern California in starting the classes on the manufacture, sale and use of gas and gas appliances has inspired the northern society to investigate the possibilities of a similar project. The matter was placed in the hands of a committee composed of Messrs. Naylor, Harlan, Kimball, Johnstone and Babcock.

Report from Clifford Johnstone

Clifford Johnstone, executive secretary of the Pacific Coast Gas Association, reported on such activities of his organization that would be of interest to the gas appliance men. He announced the new home service manual as ready for distribution, and outlined briefly the Orange Star Campaign of the A. G. A. which is to be introduced on the Coast following its preliminary tryout in eastern cities.

The sale of cast iron solid stove tops, for use on grid top stoves was discussed, and the device branded a health menace by all of the speakers. Various schemes were suggested for curbing the activity of the sales crews who are peddling this equipment. The final result was a committee composed of Messrs. Egleston, Naylor, Kimball, Allen and Johnstone.

The plan of the Spring Campaign, or Gas Appliance Display, was presented by Mr. Crane, and his program endorsed in its entirety.

General Session

The general session in the evening, which was held in connection with a dinner at the Clift Hotel, polled an attendance of 210. President Louis J. Breuner was again in the chair, and acted as toastmaster and chairman of the evening. The report of the afternoon session of the Board of Directors was read by F. U. Naylor, secretary of the Gas Appliance Society. Following the secretary, Al Crane once more presented his general outline of the 1926 Gas Appliance Exhibit.

R. E. Fisher Speaks

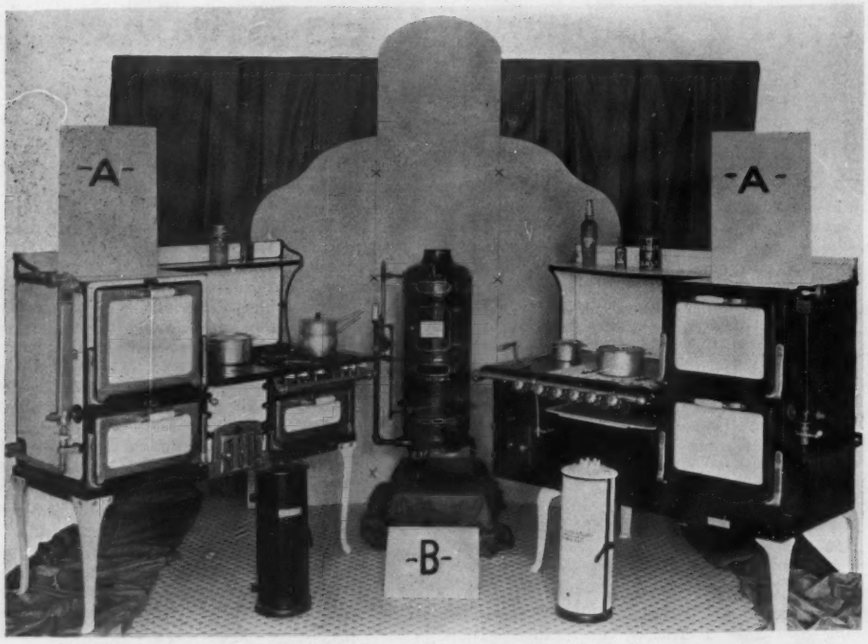
R. E. Fisher, vice-president of the P. G. & E., speaking on the general subject, "The Future of the Gas Industry," explained briefly why the gas company went out of the appliance business, and what it expected to gain by so doing. The continuance of the present system depends on the dealers, in the opinion of Mr. Fisher, who said, "I can see no immediate need for change." Fifty-seven thousand new range sales a year in the territory served by his company was the quota mentioned by the speaker to show the size of the potential market. This company is also completing plans for a 1926 gas sales drive to match the much discussed electric sales campaign of 1925.

Fred Dohrmann, Jr., vice-president of the Dohrmann Commercial Co., was the last speaker on the program with the topic, "The Importance of Co-operation." To the discussion of the age-old subject of co-operation Mr. Dohrmann brought the insight of a man whose organization has grown from one small store to a coast-wide institution. "Nothing would have been possible without the co-operation of those who have worked with us," Mr. Dohrmann said. "Co-operation is nothing more or less than the fulfillment of an implied promise," he said, in commenting on the change in business viewpoint from the time when the hardy Roman's "let-the-buyer-beware" policy prevailed. The new rule of business, said Mr. Dohrmann, is "Let the salesman beware."

After a few closing words by the chairman, the meeting adjourned at an early hour.

ALHAMBRA FACTORY SITE FOR RELIANCE MFG. CO.

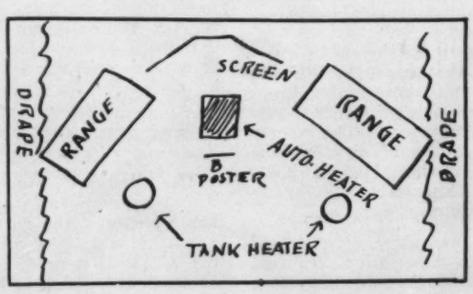
The Reliance Manufacturing Company, Pasadena manufacturers of gas regulators, has announced the purchase of a three and a half acre factory site in Alhambra, near the C. F. Braun Company plant. Work of construction will be begun within 60 days.



Another Window Suggestion *for* Ranges *and* Water Heaters

RANGES and water heaters were the subject of a window display described in *Western Gas* for February, and are also featured in the above display. The two displays are very different, however, as the above arrangement permits of considerably more variety in the number of articles introduced than did the display which appeared in our February issue, though the effect achieved is far from "cluttered." Reproducing this month's display is a simple matter from the directions given below, and the cost is negligible, approximately $3.50 covering the materials.

Use three pieces of wallboard for a background, making the center piece the height of the window. Shaping the two side pieces as shown, place them two feet from the top of the center panel, forming a screen effect. Punch holes through the board and use shoe laces to bind the pieces together. Following the illustration, drape cloth on each side, running under the ranges and to the back of the window. Light blue or light green material is recommended for the drapes, which serve to carry the vision to the rear of the display. A cold water tint of light green or light blue should be used on the background.



Place the ranges on each side of the window at an angle of 45 degrees, using a right hand and a left hand oven. Place the automatic water heater upon a covered box, against the screen at the rear of the window. Tank heaters should be placed 10 inches from the glass, the same distance from each range, as shown. Posters to carry sales messages may be arranged as indicated, one on top of each oven and one directly in front of the automatic water heater, slightly back of the tank heaters and centered between them.

Western Gas will appreciate receiving photographs of any window reproductions of the above display that are made by our readers.

F. H. SCHAFER VISITS GAS COMPANIES ON EASTERN TRIP

F. H. Schafer, general manager of the Southern California Gas Company, returned from an extensive business trip in the East just before the Pacific Coast Gas Association meeting in San Diego. Mr. Schafer visited many gas companies in the East and Middle West for the purpose of obtaining information in regard to recent developments in the handling of gas.

SAN DIEGO COMPANY APPLIES FOR PERMIT TO ISSUE STOCK

San Diego Consolidated Gas and Electric Company has applied to the Railroad Commission for authority to issue and sell $2,000,000 par value of its common stock at par to cover construction expenditures of 1925 amounting to $2,607,535.44.

WESTERN BUILDING PERMITS SHOW JANUARY INCREASES

Building permits in the principal cities of western states for January, 1926, as reported by the F. W. Dodge Corporation, show increases over the same month in 1925 as follows: Arizona, $56,800; Idaho, $8,100; Montana, $3,700; New Mexico, $31,600; Washington, $2,353,100.

CUT BANK, MONTANA, CITIZENS APPROVE GAS PROJECT

Citizens of Cut Bank, Montana, in a recent election authorized the city council to negotiate a natural gas franchise with E. B. Coolidge and E. J. Hubbert, the franchise to run for 38 years. Twenty-two miles of line must be laid to serve the town, and construction is expected to start in the near future.

SPECIAL MACHINE CLEANS PIPE FOR SO. CAL. GAS CO.

At the main plant of the Southern California Gas Company in Los Angeles, pipes are being cleaned and painted by a machine at a rate of speed of nearly ten times that of hand work. This machine was invented by H. S. Christopher, one of the Southern's engineers in the Company's research laboratory.

TUSCON COUNCIL ASKED TO CALL FRANCHISE ELECTION

A committee appointed by the city council of Tuscon, Arizona, for the purpose of investigating gas and electric light rates now in force in that city has tendered a resolution to the city council asking for an election to extend the Tuscon Gas, Electric Light and Power Company's franchise, on the basis of new rates arrived at in conference with the company's representatives.

BOND ISSUE FOR TWIN CITIES GAS CO. BETTERMENTS

Twin Cities Gas Company has been authorized by the Railroad Commission of California to issue and sell on or before June 30, 1926, at not less than 90 per cent of face value, plus accrued interest, $34,000 of its first mortgage six per cent bonds, due 1939, and to use the proceeds to pay for gas plants and properties located in Hemet and San Jacinto, and to pay for extensions and betterments.

$500 FOR REFRIGERATION STUDY OFFERED BY PANAMA COMPANY

Paul Vecker, vice-president of the Panama-Colon Gas Company, sees a need for co-operation in furthering experimentation on gas refrigeration apparatus. To this end he wrote recently to the American Gas Association, offering a contribution of $500 as a nucleus for a fund to establish a laboratory for this experimentation.

GAS FOUND SUPERIOR TO OIL BY BRICK COMPANY

Gas fuel is more satisfactory, as well as cheaper, than oil, for burning bricks, says the King Lumber Company of Bakersfield. This testimony should be final, for in the month of September alone the company used 20,000,000 cu. ft. of gas in burning 3,000,000 bricks. The kilns recently constructed are served with gas from the lines of the San Joaquin Light and Power Corporation.

GOLF TOURNEY DUE SOON FOR PACIFIC GASOLINE

Some week-end in March Pacific Gasoline Company golfers will cross sticks in the company's annual tourney, and elimination contests are now in progress to determine the representatives of the various divisions.

CUSTOMER OWNERSHIP CAMPAIGN UNDER WAY IN CALGARY

One hundred employees of the Canadian Western Natural Gas, Light, Heat and Power Company of Calgary, Alberta are engaged in selling securities in a customer ownership campaign recently launched by C. J. Yorath, president of the company.

HAVRE NATURAL GAS COMPANY TO CARRY HEATING LOAD

The Havre Natural Gas Company will be able to offer natural gas for heating as well as cooking, if gas is piped from the Bowes structure to Great Falls, it was reported at the company's annual meeting held January 25th at Havre, Montana.

POMONA FURNACE MANUFACTURER BUYS PLANT FOR FACTORY

B. F. Caldwell, Pomona, Calif., manufacturer of gas furnaces, has purchased the plant of a defunct adding machine company at Pomona, and will move his factory to the new site soon. Expansion of operations will accompany the move, according to Mr. Caldwell.

COOKING PROBLEMS SOLVED FOR SAN FRANCISCO HOUSEWIVES

Every Tuesday and Thursday from 10 to 11:30 a.m. the Pacific Gas and Electric Company's home service representative, Mrs. D. R. Withers, is at home to San Francisco homekeepers who want advice on cooking. The service of this question bureau is in growing demand.

NEW OFFICE BUILDING AT SAN BERNARDINO FOR SO. CAL. GAS

A two-story office building is to be erected by the Southern California Gas Company immediately in San Bernardino. Plans have been drawn and approved, and the building as erected will follow the same lines of architecture as have been employed by the Company in other branch offices throughout Southern California.

$266,000 FOR COAST COUNTIES GAS DEPARTMENT EXPANSION

S. Waldo Coleman, president of the Coast Counties Gas and Electric Company, which serves Pittsburgh, Santa Cruz, Watsonville, and other communities in northern California, announces an expansion program for 1926 which includes planned expenditures of $266,900 on development of gas service in 1926. Erection of a new office building at Pittsburgh, and a $95,000 extension of service from Crockett through Rodeo and Pinole to a point near Giant, are the main features of the program.

OLD GUARD BANQUET FOR L. A. G. & E. CORP. EMPLOYEES

For 14 years the Los Angeles Gas and Electric Corporation has annually held an Old Guard banquet in honoring those of its employees who have passed 10 or more years in the service of the corporation. On February 3 the 1926 banquet took place at the Biltmore Hotel, at which a choice menu and a full program combined to interest a full attendance. During the evening two employees, John Boulger and Sam Bangerter, were presented with 35-year pins by Wm. Baurhyte, president of the corporation; five employees received 25-year pins, 20 received 20-year pins, 31 received 15-year pins, and 17 received 10-year pins.

Give *the* Appliance Salesman *a* Chance!

(*Continued from Page* 18)

ing more and more confused and perplexed as time wore on?

She asked the merits of the closed top, and ere the explanation was half over, her eye was appraising the lines of the next door model, resplendent in all of the glory of its open burners. She recognized the mark of one well advertised product, but no sooner had she done this, than another trade name projected itself with equal familiarity into her consciousness.

And so our friend, though he talked like a good fellow, might almost as well have contented himself with following the customer around the store and drawing attention to each stove by pounding briskly on the lid with a lifter. She suspected he was talking about the stove near which he was standing, but what he said left never a dent in her consciousness. Her sum total of information about any one stove which might suit her particular needs was no greater when she walked out the door, with the old reliable "Think it over", than it was when she entered.

The Cure

As I watched the salesman wage his losing battle, I began to wonder how things could be arranged so that the going would be a little less rough in his next encounter. How could this clamor of conflicting mental impressions be stilled? How could the hubbub caused by innumerable pieces, styles, prices, makes and models be hushed to an extent that the salesman could give an easy, convincing and effective talk on one piece of merchandise at a time.

And I turned once more to friend Al Crane. The problem was no new one to him—that I rather anticipated. He had a pet solution of his own, as I might have known, and when he told me that he had used it himself, and that it actually worked, I was convinced.

The idea is simply this: pick out one good moderately priced stove—one that should prove the most universally adaptable to the trade to which your own store caters, and then proceed to give it a personality of its own. Remove it from the indiscriminate herd. Set it off in an alcove or if possible in a room by itself. Connect it to the gas line, so that it can be shown in operation, and then make it the piece around which the salesman can center all of the prospect's attention while he is talking on the general points of superiority of present day cooking equipment.

If space permits, it might even be advisable to set up a small model kitchen around this one piece of merchandise. The reaction this bit of strategy produces is simple enough. The woman from the very outset sees the stove in a domestic setting, and unconsciously allows herself to visualize it in her own kitchen.

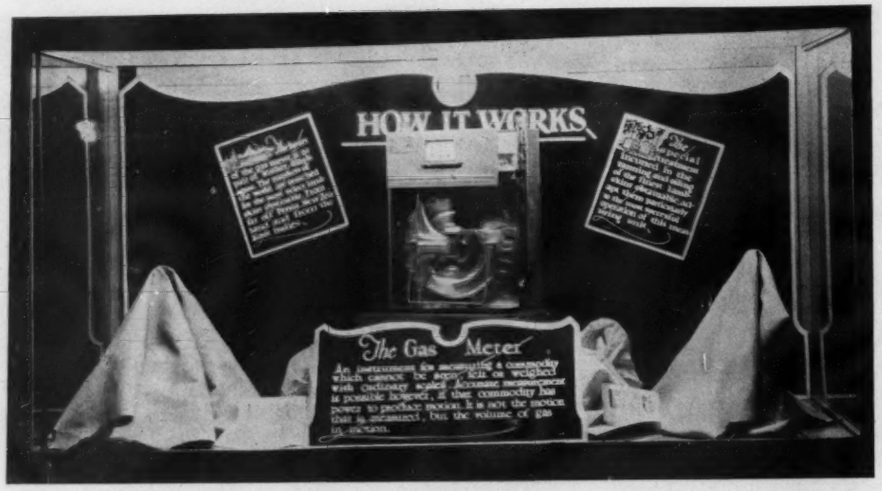
Sit Behind the Wheel!

Have you noticed how the automobile salesman encourages you to "Just get in and sit behind the wheel?" He allows you to think that he merely wants you to notice how comfortable the seat is. But he knows well enough, that in reality you are picturing yourself driving down the avenue, owner of the proud and shining equipage. He is making it easy, in other words, for you to "sell yourself." We must give the housewife the same opportunity to "sell herself" on the idea of the new equipment as it will look when fitted into her own domestic scheme of things.

The plan lends itself to infinite variations and elaborations as space and financial ability and sales possibilities permit. It might be a wise and farseeing thing, for example, to have a woman demonstrator-salesman in attendance, actually using the equipment. Al Crane even went so far as to have the coffee put on the fire, and a small cup of coffee was served to any shopper who cared to spend a few minutes in the kitchen, watching the demonstration and listening to the sales talk.

Occasionally, of course, the prospective purchaser will state quite frankly that the stove in question will not quite suit her needs. Then it is time enough to mention that there is an infinite variety of sizes and models. After she has made known her exact requirements, the salesman may take her directly to the type of stove that she has described. By reason of the fact that she has already succumbed to the idea that she needs the new stove now, the closing of the sale should be a comparatively simple matter.

It may be that the industrious young salesman will see what has here been set down about him; and it may be that some time his chief will decide to spare him the necessity of delivering his sales talk in the midst of the din of a mighty battle of conflicting visual impressions. Between now and then, he may find some assistance in bearing in mind the obvious truth that you don't sell people stoves, but rather than you sell each individual one particular stove. Until the customer has been tactfully led to center her attention on one piece of merchandise, the first hurdle has not yet been cleared in the race toward a sale.



This P. G. & E. display shows the consumer what's behind his gas bill.

Record Window! It Drew 171 *an* Hour

A WINDOW display that stopped on an average of 171 pedestrians every hour during the day from 8 a. m. to 9 p. m. was the result of an idea that originated in the publicity department of the Pacific Gas and Electric Company at San Francisco.

The big windows of the general office building were devoted to a display of apparatus and explanatory matter on large cards, showing how meters are tested to insure absolute accuracy of measurement.

That the public is really interested in the mechanics back of the monthly gas bill was attested by the large number who stopped during the day, and the length of time they consumed in reading the text carefully, from beginning to end. The meter itself was displayed in a small portable cabinet, a cutaway arrangement providing a view of the working mechanism inside the familiar tin box.

Selling Gas *in the* Torrid Zone

(*Continued from Page* 15)

Sale of gas is made on a sliding scale as usual, but according to Mr. Vecker, his Company goes a step further in dealing with certain kinds of loads. For example, in Panama bakers can't use gas at domestic rates at a profit; hence, to bakers a 25 per cent discount from the base rate is allowed on all gas used between the hours of nine p. m. and five a. m. This means selling gas right on the border line of cost, but Mr. Vecker affirms that it pays, since the gas doesn't "sour over night," and general overhead costs are cut in proportion to the increase in total sendout.

Making Publicity Pay

If any one phase of good utility operating policy is emphasized in Panama more than another it is that of publicity. This department is under the favored wing of the general manager, and has been made to produce returns in increased sales—as well as in an equally important asset, the active good will of the Panamanian public. Every periodical in the field is advertised in regularly, in Spanish or English, a regular space of two columns by five inches being used. Advertising is properly viewed as a legitimate operating expense, and there is no reason to charge it to "donation," for it produces.

Due to effective publicity the advantages of gas, the ideal fuel for domestic use, are known far and wide in Panama, and favorable attention is constantly directed toward the Panama-Colon Gas Company. As a result Mr. Vecker, as well as his Company, is known throughout the entire Zone as an enthusiastic friend of Panama—"un entusiasta amigo de Panama,"—to quote an opinion voiced in "La Prensa Ilustrada," a publication of Panama City which recently devoted several pages to an exposition of the Gas Company.

Necessarily the publicity policy is shaped to conform to the population served, and the reaction from all elements, English, Panamanian and others, reflects a high regard for the Company and its management. The Company is looked upon as a Panamanian institution.

Good Will in Spanish

Nothing could be more appropriate in proof of the above than a headline which appeared in the November 29 issue of the journal just mentioned: "Casi todos los empleados de la Compania del Gas, son Panamenos. Gran parte del capital, es tambien panameno." Translated the headline reads: "Nearly all of the employees of the Gas Company are Panamanians. A large part of its capital is Panamanian money."

In the best sense of the word Mr. Vecker is an opportunist in his publicity policy. When the Republic of Panama has a birthday the Gas Company ad copy says "congratulations;" when modern gas ranges are installed in the kitchen of the Colon Hospital, the Gamboa penitentiary and the Panama jail, the Panama public knows about it; even Hallowe'en is turned to the service of gas advertising, and readers of Panama Spanish and English newspapers are told that the English word "gas" is a derivation from the German word for "ghost"—a logical tie-up. Not long ago a Panama newspaper conducted a beauty contest, like its prototypes farther north, and the Gas Company was well represented by some quality gas ranges on the list of awards. Needless to say, there was much publicity attached, and all of it favorable.

The representative advertisements reproduced with this article give a fair idea of the requirements of the Panama-Colon Gas Company's field, for they read in Spanish and Chinese as well as English. While we can only guess at the content of the Chinese message, our guess is that it is a good one.

Not only in its publicity methods does the Panama-Colon Gas Company keep step with approved gas utility practice. When Gas Company bonds are to be sold the Company sells them at home, instead of tapping available markets in the United States. The first public utility bonds ever sold on the Isthmus were the first mortgage, 20-year, eight per cent coupon gold bonds issued in 1921 by the Gas Company, and seven-nineths of the issue were bought by Panama investors. A second issue put out toward the close of 1925 to finance expansion projects mentioned in this article was locally subscribed to the amount of $64,000 even before being publicly advertised. So customer ownership is becoming an actuality in Panama.

Alive to Industry's Needs

The many miles separating the Company from sister companies in the States form no barrier as far as concerns anticipating the needs of the industry. Mr. Vecker takes a keen interest in the work of the gas associations, and is thoroughly alive to the importance of the research being undertaken. A letter he recently addressed to the American Gas Association urges the need for further improvement of gas appliance design, to the end of more efficient operation and consequent increase in sale of gas. Another communication from Mr. Vecker on behalf of his Company offers $500 as a nucleus for a fund to be devoted to further laboratory experimentation in the development of gas refrigeration apparatus. Situated in Latitude North nine as the Panama-Colon Gas Company is, we can understand the interest taken in refrigeration, and the management is to be complimented on its desire to get at the upbuilding of the new load.

Able assistance in the promotion of gas service in Panama is being rendered Mr. Vecker by his two division managers, Clarence Cope at Colon, and Chas. O. S. Howard at Panama. Mr. Cope was formerly with the Pacific Gas and Electric Company at Oakland and San Francisco. He is assisted at Colon by "Stony" Pearson, graduate of Stanford University, and erstwhile employee of the Portland Gas and Coke Company. Mr. Howard, superintendent of the Panama division, has a 14-year background of experience in the gas industry, coming to the Panama Company from the Hartford Gas Company, Hartford, Conn. H. T. Kirkpatrick, assistant manager at Panama, is a graduate of the mechanical engineering department of the Oregon Agricultural College, and previous to his present connection served as plant engineer for the Portland Gas and Coke Company.

Only a few bright spots in the short history of this far south branch of the American gas industry can be brought forth in our limited space. It should add something of value to our notion of the Canal Zone to know that it boasts a thoroughly modern gas service, and that the Company providing that service is operating along sound lines and serving an unusual field to everyone's satisfaction. We can do no better in closing than to quote from a Panamanian daily newspaper which states that gas has "won the market", is "established on a bedrock", with the happy result that it is "here to stay and grow."

GAS DEVELOPMENT ASSURED IN ROCKY MOUNTAIN STATES

GAS in commercial quantities is now known to exist in most of the Rocky Mountain States. Quoting from the Denver Post for February 14, under the heading, "Gas Field Is 90 Miles Long":

"A veritable sea of natural gas underlies a portion of the western slope of Colorado and extends far west into Utah. This was again shown in the strike of several million cubic feet daily in the Frontier sands in the Marland test well north of Mack.

"Nearly a dozen test wells have been drilled at various places long the structure between Clifton, Colo., and Cisco, Utah, and invariably gas in commercial quantities has been struck. The Cisco well came in with a flow of 90 million cubic feet daily, caught fire from lightning and burned like a 300-foot torch several weeks before it was extinguished. Several others, on the Colorado side of the line, came in with force exceeding 50 million cubic feet.

"Drilling in the Marland well will be continued until the Dakota sands in which the Moab oil gusher was struck, are reached."

NATURAL-GAS GASOLINE STOCKS ON PACIFIC COAST, 1923-24

Month	*Inside U. S.*	*Total Stocks*
June 30, 1923	42,232 bbl.	42,232 bbl.
July 31	36,043 bbl	36,043 bbl.
August 31	47,321 bbl.	47,321 bbl.
September 30	56,629 bbl.	56,629 bbl.
October 31	67,865 bbl.	67,865 bbl.
November 30	59,109 bbl.	59,109 bbl.
December 31	63,075 bbl.	63,075 bbl.
January, 31, 1924	33,220 bbl.	83,220 bbl.
February 29	174,247 bbl.	174,247 bbl.
March 31	191,146 bbl.	191,146 bbl.
April 30	226,466 bbl.	226,466 bbl.
May 31	189,142 bbl.	189,142 bbl.
June 30	236,480 bbl.	236,480 bbl
July 31	140,933 bbl.	240,933 bbl.
August 31	141,953 bbl.	141,953 bbl.
September 30	148,976 bbl.	148,976 bbl.
October 31	118,392 bbl.	118,392 bbl.
November 30	109,241 bbl.	109,241 bbl.
December 31	50,367 bbl.	50,367 bbl.

PACIFIC GASOLINE TO HAVE SAFETY TEAM IN MEET

Classes in first aid work among the northern division employees of the Pacific Gasoline Company are now in the formation stage, and it is planned to develop a picked team to represent the company in the state California meet at Sacramento next summer. The classes will be under direction of someone assigned by the U. S. Bureau of Mines.

DATES FOR NATIONAL GAS ASSN. CONVENTION CHOSEN

May 17 to 20, inclusive, are the dates for the annual convention of the Natural Gas Association of America and the Natural Gas Supply Men, Inc., to be held at Tulsa. Buildings of the International Petroleum Exposition will be utilized for the sessions and exhibits of the two organizations, and program arrangements are well under way, according to Guy F. Batchelor, secretary of both associations.

PUBLIC RELATIONS SESSIONS NEW L.A.G. & E. ACTIVITY

In beginning a series of public relations conferences within the ranks of its employees the Los Angeles Gas and Electric Corporation is doing some valuable pioneering. The second meeting of the series was held on January 20, and drew an attendance of 300, representing the various departments and offices of the Corporation.

What *Is* Good Natural Gasoline?

(*Continued from Page 28*)

age has thus far been done, both to the refiner and the natural gasoline manufacturer. The refiner as the buyer has been the chief sinner in this regard. In attempting to protect himself against buying a wild gasoline, he has attempted to place the distillation recovery requirement as high as possible. Experience has shown that recovery requirements in the neighborhood of 85 per cent are both reasonable and fair. There are several glaring instances, however, in which the recovery specification has been placed as high as 90 per cent, and even higher, without paying the price which such a stable gasoline should obtain. It costs money for the natural gasoline manufacturer to make a product containing the maximum amount of low boiling hydrocarbons and yet having a high distillation recovery. If the refiner is willing to pay the price for the considerable additional investment and operating costs involved in manufacturing such a gasoline, well and good. That is his privilege. For the refiner to insist upon the delivery of a natural gasoline with a recovery of 90 per cent and higher manufactured in the type of plant now generally in use leads to the penalizing of both parties to the arrangement. The gasoline manufacturer is forced to weather or otherwise remove and exclude from his product a large proportion of the hydrocarbons which are most valuable to the refiner, thus cutting his own production anywhere from 10 to 40 per cent. In a market like the present, where the refiner is anxious to get all the good natural gasoline he can, the buyer who insists on such recovery requirements is hurting himself seriously, both by arbitrarily reducing the amount of natural gasoline which the manufacturer can deliver to him and by forcing the latter to remove from his product a large proportion of the low boiling hydrocarbons which would be most valuable to the buyer.

In special cases it is necessary for the buyer of natural gasoline to protect himself against delivery of a product with a high sulphur content or high gum forming propensities when his own sales specifications require his finished blended product to be free from these defects. Also there are cases in which it is conceivably desirable to limit the initial boiling point. There are also other limitations which special conditons might require, but all these are properly the subject for agreement between prospective buyers and sellers and need not be given consideration in any set of specifications which it might be desirable in the future to propose for the use of California dealers in natural gasoline.

Conclusions

It doubtless appears that a long and roundabout way has been chosen in this discussion of "what is good natural gasoline." The reason is this. In the first place, we are still learning entirely too much about natural gasoline to attempt to answer this question from the scientific or technical viewpoint. In the second place, the considerations involved are primarily commercial. We should bend our efforts to accomplish three things. First, create an atmosphere of mutual high regard so that the refiner as the buyer will cease to feel that the natural gasoline manufacturer is trying to foist on him any kind of a product, irrespective of whether it enables the refiner to make money on it or not; and in turn that the natural gasoline manufacturer may feel assured that the refiner is not going to indulge in the writing of asinine specifications which will force the gasoline manufacturer to eliminate from his product a large volume of valuable constituents. Second, we must for our mutual protection and advantage spend money in research which will show us from the technical viewpoint what really is good natural gasoline; in other words, what kind of a product the refiner can afford to buy from year to year indefinitely and inversely what kind of a product the natural gasoline manufacturer can afford to make from year to year at a satisfactory profit. Thirdly, by accomplishing the first two objects we will have developed the basis for specifications which are an advantage and a safeguard to both the buyer and seller of this now important commodity.

L. M. KLAUBER IS WINNER OF BYLLESBY PRIZE

A $100 cash award recently went to L. M. Klauber, general superintendent of the San Diego Consolidated Gas and Electric Company, for making the largest number of useful suggestions in the formulating of a manual of organization standards for field work in the construction department of the Byllesby Engineering and Management Corporation.

FEDERAL GAS COMPANY, BOULDER, COLO., TO SPEND $5,000

Appropriation of $5,000 for 1926 maintenance and development has been made by the Federal Gas Company of Boulder, Colo. New construction in 1925 totalled $5,954, and $4,175 was spent on maintenance.

THE LATEST

Hammel

Gas Steam Radiators

Unit System of Heating — Steam Heat in Ten Minutes

WE ARE now able to offer some very profitable territory to dealers who can qualify. The *Hammel* line offers a very liberal profit and its repeat orders will build a substantial business for you.

Good Territory for Live Dealers
Write for Literature

Hammel Radiator Corporation
715 So. Figueroa St. Los Angeles

Radiants!

—now made in the West

NO longer is it necessary to look to the East for radiants, as we are equipped to furnish Western manufacturers of gas heaters with *every* type. ¶ Prompt delivery is assured; the direct cooperation of our engineers is available, and as for quality, AMERICAN RADIANTS are unsurpassed. ¶ We strongly recommend your investigation, as there are obviously many advantages in using this Pacific Coast product.

Complete information and prices on request

AMERICAN
REFRACTORIES CO.
3132 ALOSTA STREET
LOS ANGELES, CALIFORNIA
Telephone ANgelus 7350

Chas. C. Moore & Co. Engineers, Inc.

CONTRACTORS FOR COMPLETE PLANTS

High Grade Machinery

The Babcock & Wilcox water tube boilers
Corliss high speed and poppet valve engines
Babcock & Wilcox superheaters
Hamilton compressors
Green fuel economizers
Wheeler Condenser & Engineering Co. condensing machinery
Cochrane feed water heaters (open and closed)
Cochrane feed water softeners (hot and cold processes)
Cochrane feed water metering heaters
Cochrane steam and oil separators
Cochrane flow meters
Griscom-Russell Heaters, Evaporators, Distillers, Multi-Whirl Coolers
Moore automatic fuel oil regulators
Diamond soot blowers
Lagonda tube cleaners
Copes feed water regulators
Lagonda automatic boiler stop valves
Leslie reducing valves

And All Power Plant Auxiliaries

Address our nearest office for catalogs and complete information

Home Office: San FRANCISCO, Sheldon Bldg.
New York City, Hudson Terminal Bldg.
Los Angeles, Central Bldg. Portland, Gasco Bldg. Seattle, L. C. Smith Bldg.
Salt Lake City, Kearns Bldg. Honolulu, T. H. Phoenix, Heard Bldg.
Vancouver, B. C., Standard Bank Bldg.

A Remarkable Gas Well

FOR the past year the Royalite No. 4 well of the Imperial Oil Company, located in the Turner Valley field about 40 miles south of Calgary, Alberta, has been making history. C. O Stillman, president of the company, writing in the January 16 issue of the Montana Oil Journal, describes the well as "unparalleled in the history of oildom." He gives the following review of the development of this wonder gas producer:

"Its early days were marked by subterranean upheavels and disastrous fires, but, since emerging from this chaos, it has docilely yielded up some 17,500,000 cubic feet of extremely "wet" gas daily, from which, in the first year of its activity, approximately 160,000 barrels of crude naptha has been extracted.

"It is a coincidence that the output of this one well in 1925 should practically equal barrel for barrel, the entire production from Canada in the previous year, but, the product of Royalite No. 4 being crude naptha of 72 degrees Beaume gravity, its yield would represent an addition of possibly 700,000 barrels of average crude petroleum to the country's resources, so far as the recovery of gasoline is concerned. The heavier products of ordinary crude—lubricants, waxes and fuels—would not, of course, be available.

"The gas, from which the naptha is extracted by Smith Separators, has not, until quite recently, been available for use owing to its high sulphur content. Now, however, a scrubbing plant utilizing the Koppers process of gas purification has been erected, a new main has been laid from the field to Calgary, and largely augmented gas supplies will now be available for industrial as well as domestic use in that city. A 4-inch gasoline line also links the field with Imperial Oil's Calgary refinery and the hazards of road haulage under adverse weather conditions are eliminated."

NATURE GIVES BUFFALO A GAS HOLDER GRATIS

The most remarkable gas tanks in the world are being used near Buffalo, New York. Vast numbers of small connected underground cavities, all inclosed in a shell of impervious stone, like a gigantic sponge in a closed jar, holding twenty times as much as the largest man-made gas tank, formerly made up the Zoar natural gas field. The supply of natural gas has been drained from the field, and the empty sponge is now serving as a tank into which gas from other wells is pumped during the summer for use during the winter, when the demand is greater than the supply.

It has been estimated that this natural gas holder, which is near Springville, twenty-five miles south of Buffalo, will contain upward of 400,000,000 cubic feet of gas.

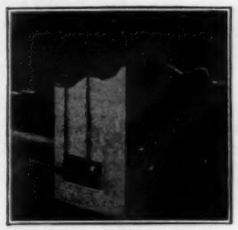
COKE SALES GAIN IN SPOKANE GAS AND FUEL COMPANY

A gain of some 50 per cent during the past year is reported for coke sales of the Spokane Gas and Fuel Company as compared with the year previous. Educating the public in the proper use of coke explains the increased sales, says James L. Stone, manager of the Spokane utility.

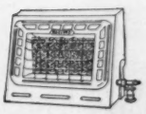
BARNEY PEDERSON RECOVERED FROM ILLNESS

Friends of Barney Pederson of San Francisco noted with pleasure his attendance at the San Diego sectional meeting of the Association, made possible by his recovery from an illness of some three months' duration.

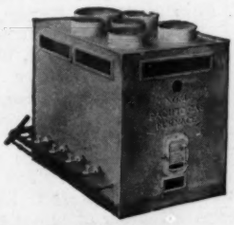
Pacific Pressed Metal and Cast Iron Radiators



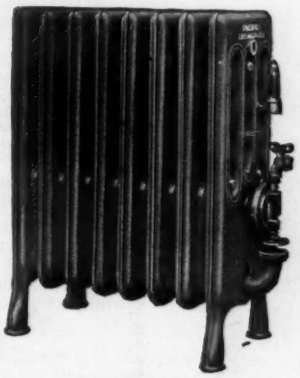
Pacific Floor Furnaces



Pacific Gas Recess Radiant Heaters



Pacific Unit Furnaces



Pacific Gas Steam Radiators

You'll Never Have to Fit a Square Peg Into a Round Hole With Pacific's Complete Line

You wouldn't try to heat a school room with a radiant heater, nor a one-car garage with a basement furnace. Yet you do know of cases, less extreme, where the wrong type of appliance was used—where by driving a square peg in a round hole the dealer "got by," but lost a customer.

AVOID THIS WITH PACIFIC'S COMPLETE LINE!

By concentrating on Pacific's complete line of six types of gas heating appliances you can always give the customer satisfaction. Taking into account all factors—type of construction, size of rooms, customer's buying ability, etc.—you can recommend the **one best** heating unit for the purpose. Ability to give service when others fail will become your greatest asset.

LESS DUPLICATION, LESS CAPITAL REQUIRED

There is no duplication in the Pacific line—this means less money tied up in stock, less bookkeeping, less financial worry, and greater efficiency in buying and selling.

Remember, too, that the assistance of Pacific Heating Engineers is FREE to all Pacific dealers. Write for agency proposition.

See listing in Sweet's 1926 Architectural Catalog—Pages 2220-1 and 2116-7.

Pacific Gas Radiator

Gas Heating **Company** *Headquarters*

1740 W. Washington St.—BEacon 2190 616 West 8th St.—MEtropolitan 2398

Factory and Foundry 7541 Roseberry Street, Los Angeles. Branches Throughout the West.

OIL METERS

The

EMPIRE

Positive displacement, oscillating piston design.

Different from every other type of meter.

Unsurpassed in over forty years for accuracy, durability, and low cost of upkeep.

Used with highest satisfaction by

Gas Companies

in every section of the country.

Made in all sizes, 5/8 in. to 6 in., inclusive.

EMPIRE Oscillating Piston Oil Meters are fully described and illustrated in Circular 110-W. Send postal for your copy.

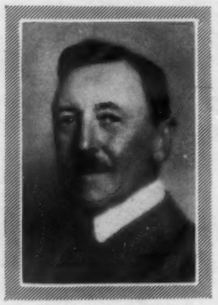
National Meter Company

299 Broadway, New York

Chicago Boston Atlanta
San Francisco Cincinnati
Los Angeles

So. Counties' Election *in* February

THE Southern Counties Gas Company held its annual election of officers and directors at the Company's headquarters, 810 So. Flower Street, Los Angeles, on Wednesday, February 17. The election resulted in the re-election of the officers and the directorate as follows:



Ferdinand R. Bain

Ferdinand R. Bain, president and general manager, Los Angeles; A. Schilling, vice-president, San Francisco; A. S. Bradford, vice-president, Placentia; Charles H. Dickey, vice-president, San Francisco; Frank S. Wade, vice-president and manager, Los Angeles; Walter S. McFarland, secretary, Los Angeles; F. E. Kester, assistant secretary, Los Angeles; T. H. Dudley, treasurer, Santa Monica; LeRoy M. Edwards, counsel; M. R. Thompson, chief engineer; A. F. Bridge, executive engineer, and F. H. Bivens, general agent.

The directorate, re-elected, follows: Ferdinand R. Bain, C. O. G. Miller, Charles H. Dickey, A. S. Bradford, T. H. Dudley, John H. Bartle, Geo. A. McCrea, C. M. Stone, A. Schilling, W. B. Williams, and Frank S. Wade.

It was brought out at the recent meeting that the Company had added 8,000 new consumers during 1925, making 108,000 the total for the system. During the year the Company expended more than $3,400,000 for betterments and extensions to its system. The Southern Counties Gas Company serves cities in Los Angeles, Orange, San Bernardino, Ventura and Santa Barbara counties.

On the evening of the same day President Bain gave his 14th annual dinner to 122 officers, directors, guests and employees of the organization at the Biltmore Hotel, Los Angeles. President Bain presided and welcomed those present. Charles H. Dickey of San Francisco acted as toastmaster. Talks were made by F. S. Wade, W. B. Williams, W. S. McFarland, W. G. Rich of Whittier, F. H. Bivens, David Babcock, A. B. Day, Bernard W. Ford, A. F. Bridge, S. W. Todd, L. A. West, C. E. Rutledge and others.

On Friday, Feb. 19, Mr. Bain accompanied by Mrs. Bain, left Los Angeles on a several months tour of Europe. Mr. Bain may visit the Island of Jersey to attend the annual Jersey cattle exposition which is to be held in May. The Bains will visit London, Paris, the French Riviera, and will make a number of motor trips about Continental Europe.

Transportation *for* San Juan Basin

TWO big projects, a railroad and a pipeline, will bring long needed transportation facilities to the San Juan Basin country of New Mexico and Utah, according to February developments. Two additional discovery wells recently brought in raise the Basin's known pools to a total of seven, and with transportation promised, local hopes are high for a rapid development of the region.

D. M. Bunker, locating engineer for the Santa Fe Railroad, is supervising a corps of engineers on a locating survey between La Ventanta and Farmington, following which contracting bids on the line will be opened. S. H. Keoughan, president of the Continental Oil Company, has stated that the route for his company's pipeline would be selected by the latter part of February. The two projects are estimated to call for an expenditure of approximately $7,500,000.

Gas conditions are under investigation at the Ute Pasture fields, and the United Carbon Company's representatives are understood to be looking to the establishment of a carbon black plant in that section of the Basin. The P. & R. and the Mid-West companies have tapped over 160,000,000 cu. ft. of gas on the Ute Pasture structure.

Shipment by tank car is impractical for the Basin oil, due to its high gravity, and losses as high as 20% result. Thus the building of a pipeline will give operators a fair margin to work on and increase in operations will undoubtedly take place.

Calif. Gasoline Corp. Changes Hands

ARRANGEMENTS have been practically concluded for the taking over of the assets and liabilities of the California Gasoline Corporation, Los Angeles natural gasoline firm, by the California Petroleum Corporation, also with headquarters at Los Angeles. The consideration involved is in the neighborhood of $3,000,000, and will be paid by the California Petroleum Corporation in its capital stock.

It is understood that a new corporation is to be formed by the California Petroleum for handling its gas properties, including those now operated by the California Gasoline Corporation. The new gas department will be in charge of present employees of the California Gasoline Corporation, and R. E. Bering, now president of the latter, will serve in a similar capacity with the new organization. J. E. Hare, secretary-treasurer of the California Gasoline Corporation, E. G. Starr, and J. W. Sherman of that organization will also carry on their respective offices with the California Petroleum's gas department.

Headquarters for the new group will be in the Security Building, Los Angeles, where the California Petroleum is located. The name of the California Gasoline Corporation may be retained for the new organization. Consolidation as planned will give the California Petroleum a total daily natural gasoline output of 110,000 gallons, and further expansion is expected as conditions warrant.

VETERANS' CLUB FORMED AMONG PORTLAND EMPLOYEES

With service periods ranging from 10 to 49 years with the Portland Gas and Coke Company, 122 men and four women gathered on December 21 at the Portland Hotel to launch the Veterans' Club of that company. The new employee organization includes all ranks of workers, from the president down, on its roster, and the only preference shown is on ground of length of service.

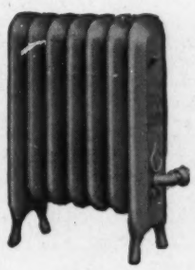
POTTER Heating

For many years POTTER Engineers have pioneered the way in the advancement of modern Gas Heating Systems. They have developed Gas Heating to such a degree of perfection that today, POTTER Products have become a standard of comparison wherever dependable, safe, economical and healthful gas heating is discussed.

OUR BEST ASSET

The tens of thousands of satisfied customers that our Organization has made through POTTER Gas Heating installations, is a JUST tribute to a satisfactory product—a gratification to conscientious effort.

THERE ARE MANY REASONS WHY IT IS BETTER TO INSTALL POTTER SYSTEMS

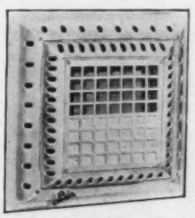


POTTER Vented Radiators

Only POTTER has these 7 POTTER Features

(Cast Iron and Steel-Made)

1. Condensation abolished. This does away with corrosion. Many years are added to the life of the Radiator.
2. Triple Circulation. The heat goes into the room, not up the flue.
3. Uniform warmth distribution. The air is never "cooked."
4. Quick heat. No other radiator heats so quickly as the light, efficient POTTER Steel-Made.
5. Aristocratic appearance. The POTTER Cast Iron Radiator is selected for the finest and largest homes.
6. Totally odorless always.
7. Not expensive.



COLE Floor and Wall Heaters

Made in heavy solid cast aluminum.

COLE is the only furnace manufactured that can be installed on either the first or second floor.

"MAGIC WAY" FURNACES

"MAGIC WAY" was the first, and has always been considered the leading Unit System of heating.

The principle of Unit Heating of modern buildings, brought to its present state of refinement through the study and efforts of this Organization, is based on the principle of an individual furnace or heater for each room or group of rooms to be heated.

This type of installation allows accurate temperature control in each room, regardless of the demand in other sections of the home.

POTTER quantity production now makes "MAGIC WAY" with electric controls, available to anyone who desires a gas furnace system.

The same features that make these well known POTTER-made appliances favorites with home builders and home owners, make them popular with churches, schools, theatres, auditoriums and factories.

The low cost of adequate heating by means of "MAGIC WAY" Vented Furnaces of either the Unit or Central Plant type, will be a revelation.

"MAGIC WAY" VALVES

By merely pressing a button, the temperature of any room may be regulated. This valve not only turns the heat on but it regulates the heat to suit your exact wants.

The HALL Floor Furnace

When the furnace type of heat is desired at low cost or when a basement is not available, use HALL Vented Floor Furnaces.

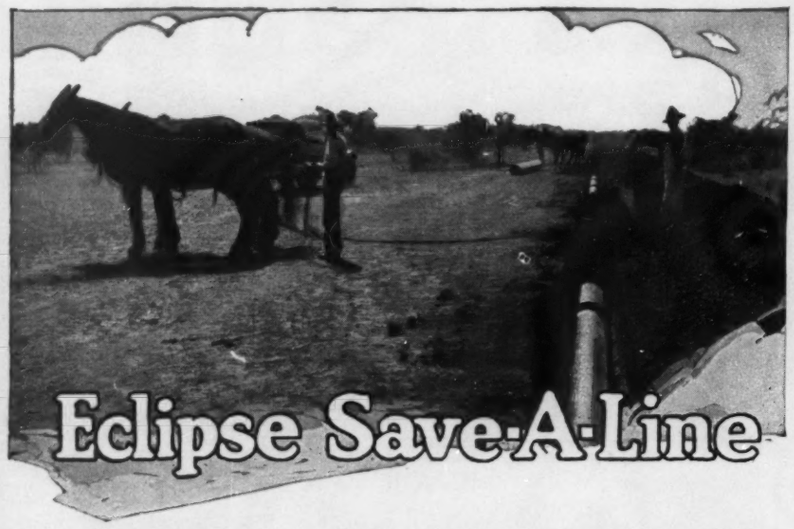
Potter Heating Includes:

"MAGIC WAY" UNIT FURNACES
"POTTER" GAS RADIATORS
"RA DO" GAS RADIATORS
"HALL" GAS FURNACES
"STEEL-MADE" GAS RADIATORS
"COLE" FLOOR AND WALL FURNACES

There Is a **POTTER System** for Every Need

POTTER RADIATOR CORPORATION

San Francisco—Oakland—Los Angeles—San Diego



Eclipse Save-A-Line Securely Protects Hundreds of Miles of Pipe Line on The Pacific Coast.

Eclipse Save-A-Line forms a thick, elastic film or coating, reinforced with asbestos fibre, which contracts and expands with the pipe and is unaffected by moisture, alkali, lime or electrolysis. It can be applied without heating and by inexperienced labor.

Let us know your requirements. We will be glad to send you sample and quote you prices. If you have any particular difficulties peculiar to your soil or climate, our San Francisco Office, 523 Rialto Building, Mr. E. B. Hagar, Manager, is at your disposal.

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(Continued from Page 22)

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J. M. Guenthard, Sr., Foreman, Los Angeles Gas & Electric Corp., P. O. Box 1100, Station C, Los Angeles, Calif.

F. W. Hickman, Pacific Gas & Electric Co., 245 Market Street, San Francisco, Calif.

Elton M. Hogg, Chemist, Pacific Gas & Electric Co., San Jose, Calif.

Harold J. Hood, Los Angeles Gas & Electric Corp., Los Angeles, Calif.

A. T. Howard, Inspector, Los Angeles Gas & Electric Corp., P. O. Box 1100, Station C, Los Angeles, Calif.

T. P. Jenkins, Dist. Foreman, Pacific Gas & Electric Co., Santa Rosa, Calif.

Willis A. Kohlhoff, Estimator, Pacific Gas & Electric Co., San Rafael, Calif.

H. A. Lee, Supt. of Supplies, Portland Gas & Coke Co., Portland, Oregon.

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Wm. N. Markward, Meterman, Los Angeles Gas & Electric Corp., Alhambra, Calif.

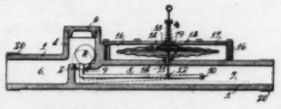
Robert W. Miller, Vice-Pres. and Treas., Pacific Lighting Corp., 433 California Street, San Francisco, Calif.

H. D. Keillor, Engr., Los Angeles Gas & Electric Corp., P. O. Box 1100, Station C,

(Continued on Page 40)

THIS MONTH'S PATENTS PERTAINING TO THE INDUSTRY

1,552,822. GAS VALVE. George A. Cathey, Portland, Oreg. Filed Feb. 3, 1925. Serial No. 6,640. 1 Claim. (Cl. 67—115.)

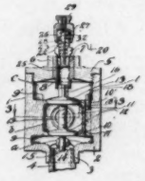


A device of the class described comprising a pipe-like conduit length threaded at its opposite ends to facilitate splicing into a gas conduit, a valve housing projecting from the upper walls of the conduit length and having a valve seat therein, a gravity actuated valve operable in the housing, a removable closure cap for the housing, a diaphragm housing projecting from a wall of said conduit length, a closure cap for the diaphragm housing having a port providing atmospheric communication therein to, a hollow diaphragm in the diaphragm housing, said conduit length having a port leading into the diaphragm housing and said diaphragm being so mounted that that port communicates with the interior thereof, an actuator rod connected to a part of the diaphragm to be moved thereby when distended, and a pivoted lever to which said rod is connected and which is constructed and mounted to cause unseating of the valve against gravity action when the diaphragm is distended.

1,550,150. DRY GAS METER. Albert George Cooke and Benjamin Charles Phillips, Brighton, England. Filed May 25, 1923. Serial No. 641,522. 3 Claims. (Cl. 73—1.)

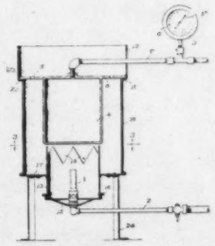
1. In a dry gas meter, a gas bellows, a sheet metal partition, two rims soldered thereto, each of said rims provided with a gas outlet and a circumferential groove near the outer end which latter is curved outwards, a removable diaphragm partly of a flexible material with a wired edge, two discs each having an annular groove and a central orifice, said flexible material interposed between said discs and secured at the center, a split ring with a depression in its respective ends adapted to fit in said circumferential groove over the removable diaphragm.

1,548,654. AUTOMATIC GAS CUT-OFF. Thomas H. Boyd, Pawhuska, Okla. Filed Sept. 25, 1924. Serial No. 739,909. 12 Claims. (Cl. 07—115.)



1. An automatic gas cut-off of the class described comprising a casing having a gas inlet and outlet, a chamber between said inlet and outlet, a self closing valve member freely movable mounted in said chamber controlling the inlet and adapted to be unseated by the gas pressure acting thereagainst in one direction and supported by the flow of gas therethrough, and means whereby the pressure is caused to be exerted against the valve member in the opposite direction to hold the valve member closed upon resumption of the gas pressure

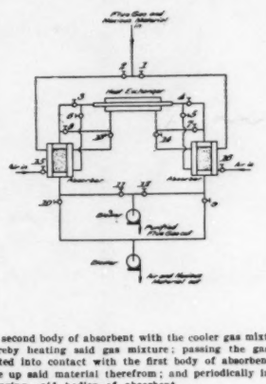
1,549,529. RECORDING CALORIMETER FOR GAS. Stewart R. Fisher, Marinette, Wis. Filed Aug. 8, 1924 Serial No. 730,961 3 Claims. (Cl 73—184.)



1. In a calorimeter, the combination of an air chamber, a registering device in communication therewith, a plate fixed to the upper end of said chamber and surrounding the same and having apertures, a flue member disposed below the air chamber and open at its upper and lower ends, an annulus surrounding and fixed to said flue member at an intermediate point in the height thereof, a burner supported in the flue member and adapted to be connected with a source of gas supply, means connected to the annulus for the support thereof, said annulus having a fold at its outer edge, a cylinder surrounding and spaced from the air chamber and the flue member and having an outwardly directed flange at its lower end disposed in said fold of the annulus and also having a shoulder at an intermediate point of its length for the support of said perforated plate and further having a portion surrounding and extending above said plate, and a lining of non-heat conducting material arranged within the cylinder and having a flange between the annulus and the lower cylinder flange and also having a portion on the shoulder of the cylinder and a portion between the perimeter of the perforated plate and the cylinder portion about said plate.

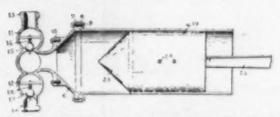
1,548,280. PROCESS OF RECOVERING ABSORBABLE CONSTITUENTS FROM GAS STREAMS. Arthur B. Ray, Bayside, N. Y. assignor to Carbide and Carbon Chemicals Corporation, a Corporation of New York. Filed Nov. 12, 1924. Serial No. 749,572. 10 Claims. (Cl. 183—4.)

1. Process of transferring a material carried by a heated gas mixture to a cooler gas of different composition, which comprises cooling the heated mixture by transferring heat therefrom to a first body of absorbent containing said material, thereby heating the absorbent; passing the cooled mixture into contact with a second body of absorbent to collect said material therein; cooling



the second body of absorbent with the cooler gas mixture, thereby heating said gas mixture; passing the gas so heated into contact with the first body of absorbent to take up said material therefrom; and periodically interchanging said bodies of absorbent.

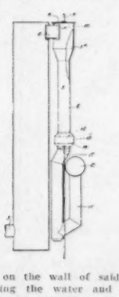
1,534,728. COMPRESSOR. William E. Noad, Jackson, Mich. Filed Jan. 17, 1924. Serial No. 686,862. 4 Claims. (Cl. 230—27.)



1. In a compressor, a cylinder, a piston head having a conical inner wall secured thereto, a member constituting an extension of the cylinder and a valve casing connected to said member, said piston having its end contoured to the configuration of the inner wall of the cylinder head, substantially as described.

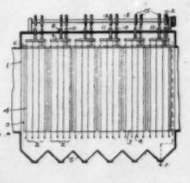
1,548,066. GAS CLEANER. Alfred Steinhart, Pittsburgh, Pa. Filed Mar. 13, 1923. Serial No. 624,758. 4 Claims. (Cl. 183—24.)

1. A gas cleaner comprising a receptacle arranged symmetrically around a vertical axis, a tangential gas inlet in the side of said receptacle adjacent its upper end, said tangential inlet being adapted to impart a whirling motion to the impurity laden gases entering through said inlet, a liquid atomizing nozzle in the axis of said receptacle on a level with the tangential gas inlet adapted to deliver and intimately mix atomized liquid with the center of the whirling gases whereby solid impurities and atomized liquid in the gases are thrown centrifugally to the wall of said receptacle, a trap in the lower part of said receptacle adapted to catch and segregate downwardly flowing liquid and



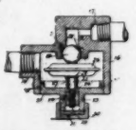
humid impurities on the wall of said receptacle, and means for removing the water and impurities from said trap, and a gas outlet from the lower part of said receptacle.

1,551,724. ART OF ELECTRICAL PRECIPITATION OF SUSPENDED MATERIAL FROM GASES. Evald Anderson, Alhambra, Calif., assignor to International Precipitation Company, Los Angeles, Calif., a Corporation of California. Filed May 31, 1922. Serial No. 564,974. 7 Claims (Cl. 183—7.)

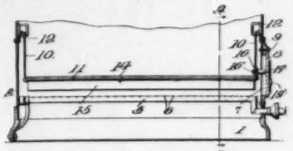


1. The method of removing suspended material from gases which consists in subjecting a gas stream to the action of a series of electrical fields, each of said fields being produced by a separate set of discharge and collecting electrodes, and cleaning electrodes of each set independently of the other sets without interruption of the gas stream.

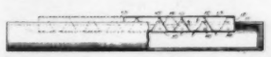
1,551,885. AUTOMATIC GAS-CONTROLLED WATER HEATER. Herbert Grant Jensen, Detroit, Mich. Filed May 10, 1924. Serial No. 712,405. 1 Claim. (Cl. 236—58.)



A thermostatically controlled valve, comprising a casing, a closure for the bottom of the casing having screw-threaded engagement with the casing, a movable bushing in the closure, a threaded stem in the bushing, a thermostatic wafer at the upper end of the stem and of less diameter than the bottom closure, a bail valve above the wafer controlling the flow of fuel, a spring around the stem between the wafer and the closure, and a gas-tight cap on the closure confining the bushing.

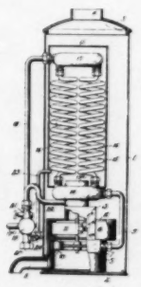
1,551,619. GAS-LIGHTING DEVICE. Charles P. Price, Boston, Mass. Filed Sept. 25, 1924. Serial No. 739,867. 2 Claims. (Cl. 158—115.)

2. In a gas stove, a gas pipe having a longitudinally alined series of burner holes, a jacket surrounding said gas pipe and having an aperture therein opposite said gas pipe, a rocker arm pivoted to said jacket, a top-pivoted door supported by said jacket, a trough carried by said rocker, means connecting said door and said rocker to move said trough to a position above said gas pipe when the door is opened and to move said trough to a non-interfering position when said door is released.

1,550,836. GAS BURNER FOR BAKERS' OVENS. William L. Mueller, Chicago, Ill., assignor to William F. Petersen, Chicago, Ill. Filed July 17, 1924. Serial No. 726,449. 8 Claims. (Cl. 158—99.)



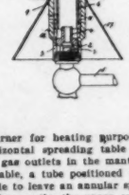
1. A gas burner comprising a gas-chamber having a longitudinal slot therein, two exterior plates placed therein, a central strip, and equi-distant separated fillers placed between and in contact with said plates and strip whereby gas-passages are provided between said fillers.

1,553,180. WATER HEATER. Mathilde Lind and Werner C. Lind, New Orleans, La. Filed Mar. 15, 1922. Serial No. 543,942. 1 Claim. (Cl. 126—351.)



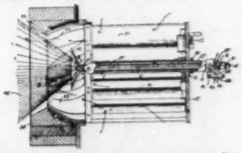
In an air and gas mixing device the combination of a mixing chamber; a gas feed pipe to the mixing chamber, said chamber being open at its lower end; a housing below the chamber; a shaft mounted to rotate in said chamber and housing; a fan mounted in said housing and rotatable with the shaft; a water pan below the housing; a water inlet pipe to said water pan; and a turbine on the shaft within the water pan so arranged that water entering the pan will operate the turbine to rotate the shaft and fan.

1,546,286. GAS BURNER FOR HEATING AND COOKING PURPOSES. Julius Carl Siegfried Koch, Hamburg, Germany. Filed Feb. 7, 1923. Serial No. 7,567. 5 Claims. (Cl. 158—118.)



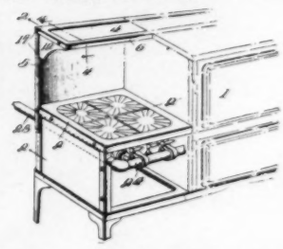
1. A gas burner for heating purposes, comprising, a mantle, a horizontal spreading table supported by the mantle, radial gas outlets in the mantle and immediately below the table, a tube positioned within and spaced from the mantle to leave an annular space therebetween, air inlets in the mantle, the upper end of the tube being open and terminating adjacent the table, a mixing nozzle positioned to feed into the lower end of the tube whereby the mixture from the mixing nozzle is forced to spread out upon meeting the table and to pass across the mouth of the annular space before passing out through the radial gas outlets.

1,549,663. HIGH-PRESSURE GAS BURNER. Ross H. Forney, Dallas, Tex. Filed June 21, 1924. Serial No. 721,435. 1 Claim. (Cl. 158—109.)



A high pressure gas burner of the character described including, in combination, an inverted bladed cone mounted in an opening in the wall of a furnace, an air supply communicating therewith, an end plate for said air supply opposite the cone, a conical shaped bladed cone, a tube slidably mounted through the end plate and carrying the conical shaped bladed cone so that the latter may be adjusted towards and from the inverted bladed cone, the inner end of the tube being also provided with a conical valve seat, a branch conductor associated with the outer end of the tube, a gas conducting pipe connected to the conductor for supplying gas to the outer end of the tube, a cone shaped valve mounted at the inner end of the tube for coacting with he cone shaped bladed cone and for controlling the supply of gas from the tube, and means for slidably mounting and operating the valve from a point exteriorly of the plate.

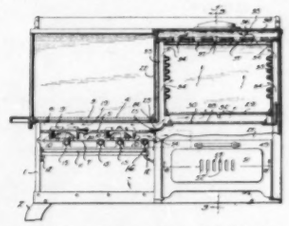
1,550,560. GAS-RANGE CONSTRUCTION. Hiram Moecker, Jr., Homewood, and Theodore Thompson and Otto Hammermeister, Harvey, Ill., assignors to American Stove Company, St. Louis, Mo., a Corporation of New Jersey. Filed Feb. 5, 1925. Serial No. 7,030. 17 Claims. (Cl. 126—39.)



1. A right or left hand oven range construction, comprising a top shelf, and an angle iron support for the shelf having its opposite ends cut out, whereby it may be used in either a right or left hand oven range by turning it end for end.

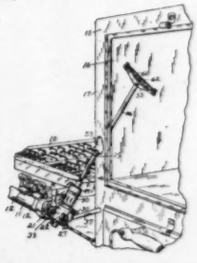
1,550,182. GAS STOVE. James G. Scott, Washington, D. C., assignor to Scott Gas Appliance Company, Washington, D. C., a Corporation of Delaware. Filed Oct. 1, 1923. Serial No. 665,913. 7 Claims. (Cl. 126—39.)

1. In a gas stove, a burner compartment, burners arranged beneath said compartment and adapted to deliver the products of combustion into said compartment, an oven arranged to one side of and above said burner compartment and connected thereto to permit the products of combustion to pass upwardly through said oven, said oven being provided with a top formed of a pair of spaced walls providing a passage through which the



products of combustion are delivered to the stack, the lower wall being provided with openings, and heat insulating means arranged in said passage adjacent the bottom wall thereof.

1,553,142. OVEN-HEAT REGULATOR. Walter E. Claus and Emil L. Claus, Milwaukee, Wis. Filed Oct. 27, 1924. Serial No. 746,003. 30 Claims. (Cl. 236—15.)



1. In a device of the character described and adapted for application to a gas range having an oven and a main or stringer pipe outside thereof, the combination with a ported valve casing adapted for connection with the stringer pipe to receive support therefrom, a valve in said casing, a thermostat adapted to be disposed within the oven and a support for said thermostat extending from said casing to the oven and carrying said thermostat free for bodily movement within the oven, and actuating connections extending substantially axially of said valve between said thermostat portion and said casing and in operative relation to said valve.

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(*Continued from Page 38*)

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F. C. Millard Engineering Co., Rives-Strong Building, Los Angeles, Calif.; Represented by either Mr. James Lowery or Mr. T. Hubbard Clements.

News Versus Facts

(*Continued from Page 23*)

upon reading a sensational and misleading headline concerning some trivial matter, and we all have been shocked by the inaccurate reporting of an event in which we ourselves have had a part. There is much to support the belief that newspapers are read first for their comic and syndicated features, secondly for news, and if the editorial comment is read at all it is with crossed fingers.

The interest of gas companies in this lies in the manner in which news is reported. We are living in a "superlative" age. Every petty thief is a "bandit," every swindler is a "master mind," and every half-presentable crook is a "King" of something or other. In the search for interesting news a regrettable incident becomes an "outrage," an accident becomes a "cataclysm," and an inoffensive gas company becomes a predatory and sinister "interest." There is seldom a deliberate untruth, but there is evidence of careless haste and a desire to provide the sensations which the public is reputed to want. Half-truths and innuendos are frequently used to color news to fit the publishers' policies. It may be a part of the day's amusement to read in one paper that "Senator Sorghum's wisdom was cheered by an enthusiastic multitude" and in another that "he driveled to apathetic empty chairs," but the gas industry is hit below the belt when Mrs. Jones dies of diabetes mellitus and is reported a victim of carbon monoxide—"the dread sleep of death," or Mr. Jones comes home drunk and kicks loose a gas connection and is sobbed over as a victim of the gas company.

The "power of the press" today lies in its news colums. It is the duty of every gas company to make close contact with its local press and investigate all news stories concerning gas, or utility policies. It is only in this way that we can accumulate a protest that will be listened to by a hard-boiled editor. Once shown that they are in the wrong, the newspapers will be glad to give us a square deal.

NEW RATES FOR SOUTHERN OREGON GAS COMPANY

A new tariff of higher gas rates, to become effective on March 6, has been filed by the Southern Oregon Gas Company, to apply in Medford, Ashland, Grants Pass and Roseburg.

Students Hear Lecture *on* Gas Distribution

(*Continued from Page* 21)

main in the street for gas service. So far as they are concerned, the main need not be larger than is necessary to properly serve; if larger, then the excess capacity is idle investment and serves no purpose. It cannot improve satisfactory service, nor is it necessary to insure good service; for if the main is of sufficient size, it is, in itself, sufficient insurance. As to future development of business on the street: such must be taken care of in selecting the original size pipe, and must be judged with due regard to local circumstances.

For convenience and reference, the mains laid to directly serve consumers are termed "distributors." Service would be satisfactory on distributors properly selected, if provision be made for delivery of gas to each. To do so, injects the next problem in design—the determination and location of "feeder mains." Pipes must then be laid through the area to furnish a supply of gas and maintain pressure on the distributors.

The "distributors," it is observed, face the property of the consumers; the "feeders" then, should run at right angles. The exact location of a feeder main is not arbitrarily fixed, nor at each cross street. The distributor sizes are selected to extend the length of a few blocks, and receive gas usually at each end.

To fix the size of a feeder, necessitates the summing up of the load on each distributor depending on that feeder. Each load, however, comes off at the distance of a block apart. This relieves the feeder line and influences the selection of its size.

As the pressure at the consumer's meter must not vary greater than allowed under G. O. 58 of the California Railroad Commission, then at no time must the limits of these pressures be exceeded on the distributor or feeder lines.

Transmission Lines

The feeder main must, in turn, have a source of supply. Maybe, in areas close to the gas works, such feeder mains will extend direct and be subject to control at the plant. However, such cases are exceptions. It is usual to provide for the transmission of gas by the building of "transmission lines" from the works to the various areas of gas consumers. These transmission lines carry high pressure or low pressure, and same may vary with demand. The feeder lines at intervals receive gas from the transmission lines through governors.

It is, of course, the practice to supply direct, consumers off the feeder or transmission lines. This service is possible with the use of service regulators.

Such is the proper design of a system of gas distribution. It insures service alike to all consumers; those at the extreme ends enjoying the same uniform pressure as those close to the works. Pipe sizes are more or less fixed for distributors, and are dependent on demand rather than upon distance from gas works. Since the distributors make up possibly 75 per cent of the system, they contribute the major cost to the capital account. If they can be kept at a minimum size, this means a lower unit investment per consumer.

These are the fundamentals in distribution practice. There are many practical problems and certain essential equipment with which it is necessary to be acquainted before the subject is covered. Proper knowledge of these can best be gained by direct contact.

For District or Individual Service—The Weighted Illuminated Regulator

A medium pressure of 15 pounds or less is reduced to a delivery pressure of a few inches of water.

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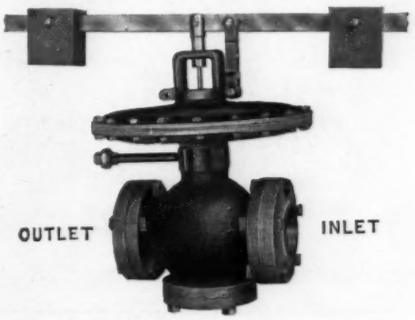

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Manufactured by

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Natural Gas *in* Montana

(*Continued from Page* 19)

can be divided into two main classes, viz:

City distribution;

Anaconda Copper Mining Company.

Large Load for Mining Co.

The load of the Anaconda Copper Mining Company would amount to an average of six million cubic feet per day, or over two billion cubic feet per year and the load factor by months would probably be 90%.

The city distribution on a basis of 100% saturation would be very nearly the same amount but the load factor would be lower. It is estimated that the peak day of the year will be two and a half times the average daily load of the year, and on this assumption the total peak load day will be about 21 million cubic feet. There should be wells available on the lines with a capacity of 50 million to 60 million cubic feet daily flow to assure regular service in the coldest weather.

Gas in these amounts will justify a pipe line and it can be sold at a price rendering it economically available for every operation requiring heat, from the largest mill to the smallest cottage.

This great industry in the northwest is in its infancy and the next few years will see the expenditure of millions of dollars in its development. We are approaching the age of gas when the science of chemistry will be paramount. Natural and artificial gas will be used for practically all heating operations at a utilization efficiency of about 85% in place of 15 to 40% with average conditions of use of hard fuels, and the present loss of millions of dollars yearly through the wastes of by-products will be an occurrence of the past.

450 B. t. u. Standard Gas

(*Continued from Page* 16)

adjustment of all of our customers' appliances, we are sure from experience of other companies that the complaints will continue to be less.

Aside from making daily B.t.u. tests in a Junker's Calorimeter, we installed a carburimeter of the Bunsen type. This apparatus, though quite simple in construction, has been of considerable value in aiding us to keep the calorific value of the gas constant.

At the present time we are installing a Recording Thomas Calorimeter and mixing valve which, when completed, will automatically mix the proper proportion of blue gas and coal gas to give our standard of 450 B.t.u. within a

variation of two per cent.

Mr. Stone supplements his article with the following data on quality of gas before and since the adoption of the 450 B.t.u. standard.—EDITOR.

Specific gravity of coal gas in September, 1925, was .53; specific gravity of producer gas was .965; specific gravity of combined gases was .66; the combined gases above contained approximately 8% of producer gas.

At the present time our coal gas contains approximately 10% of producer gas due to the fact that less coal gas is being made. We now supply gas to the city containing 30% of blue gas. The specific gravity of the blue gas is .5875. The specific gravity of our holder gas at present is .61.

Gross amount of coke made in Sept., 1924:

1432 tons make 26250 M. cubic feet.

Gross amount of coke made in Sept., 1925:

1555 tons make 26437 M. cubic feet.

Gross amount of coke made in Dec., 1924:

1665 tons make 27852 M. cubic feet.

Gross amount of coke made in Dec., 1925:

1225 tons make 28374 M. cubic feet.

The Automatic Gas Rate

(*Continued from Page* 17)

per barrel. Using this 25 cent change and an average differential of 2½ cents per thousand cubic feet would amount to a change in the gas rates of $1,000,000 per year for each 25 cent change in the price of oil.

The application of the automatic rates eliminates the necessity of formal proceedings before the Railroad Commission each time a change is made in the price of oil, and also gives immediate relief to the consumer or company as the case may be, as the rates become effective approximately 30 days from date of change in the price of oil. This is a very desirable feature as the formal proceedings consume from two weeks to three or four months and sometimes longer, depending upon the size of the company.

The results obtained through the operation of the automatic gas rates for the period 1921 to date would have necessitated some 180 formal gas proceedings before the Railroad Commission. The cost of compiling necessary statistical and cost data, which the companies would be required to produce as evidence and which would eventually be reflected in the gas rates to the consumers, is also eliminated.

RAWLINS, WYO., GAS COMPANY IN NEW OFFICES

On February 12 the Rocky Mountain Gas Company of Rawlins, Wyo., moved its offices into the First National Bank building of that city.

"There's no range like the new Gas Range"

"You'll find every square inch of its smooth-top is cooking area. Even a single burner will quickly heat a large part of the smooth-top and thus keep several vessels boiling and adjacent vessels steaming hot. Here's convenience.

"For frying, too, such distribution of heat prevents burning."

The smooth cooking surface built into the new range is scientifically constructed—therefore unlike the makeshift top.

Near you there's a dealer who carries the new closed-top Gas Ranges. Or let us tell you about these beautiful kitchen appliances.

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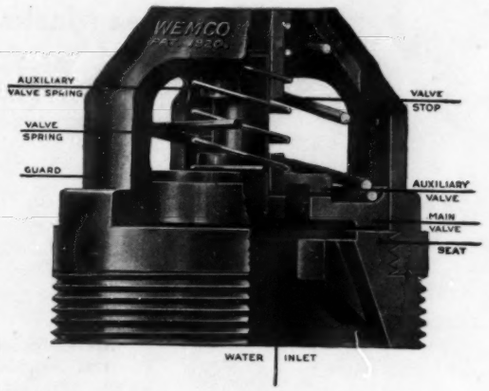

The construction of the valve illustrated is such that the lift is greater than the valve area, insuring a free and unobstructed flow. All valves are made to guage and have the same lift. It has no studs, bolts or pins to become broken or lost.

HIGH pressure between suction and discharge valves means piston and valve slip, with a corresponding decrease in pump efficiency,—a direct loss in dollars and cents is the result. Wemco engineers have found instances in which 62% increase in valve area was required to allow for the maximum flow at the operating piston speed. Where Wemco Double Guided Pump Valves were installed, the desired increase was obtained. And invariably the valves paid for themselves within a short period.

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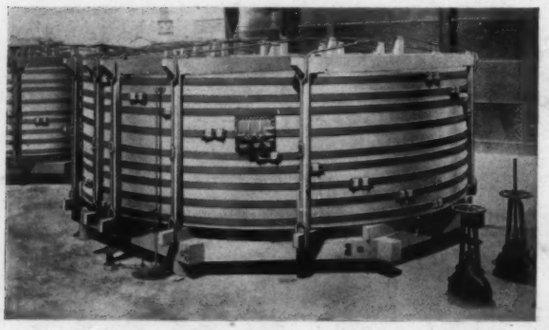

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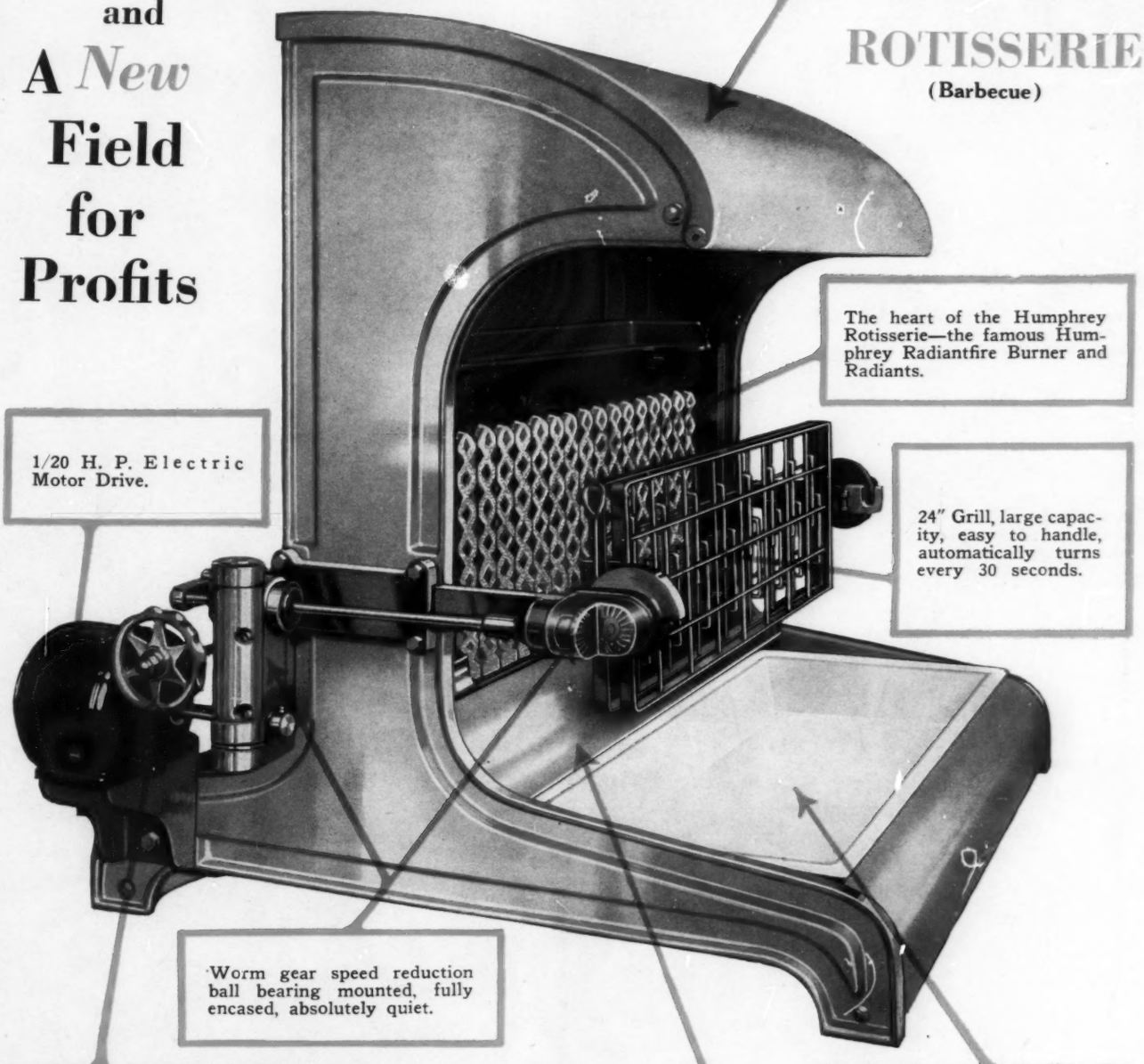
The Humphrey ROTISSERIE

(Barbecue)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24" Grill, large capacity, easy to handle, automatically turns every 30 seconds.
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In his armor, the Japanese warrior of that time presents a strange Oriental spectacle; yet it served the vital purpose of protection.

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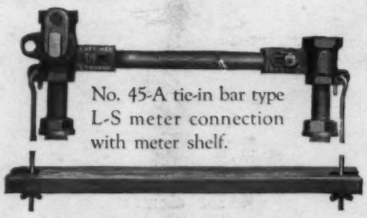

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